ment and made a part of said contract. The contract bears Number W-30-180-eng-397 and followed the standard form WD Contract No. 2 in use by the Department of the Army. The contract is on a unit price basis for the estimated consideration of $3,330,330.00.

4. Said contract provided that the work under the contract was to be commenced within ten (10) calendar days after date of receipt by contractor of notice to proceed. Notice to proceed was received July 30, 1946. Plaintiff did so proceed with the work within the ten (10) day period. Work was to be completed not later than 900 calendar days after receipt of notice to proceed. This time was subsequently extended and the Government accepted the work as completed on August 22, 1949.

[fol. 3] 5. Upon receiving the invitation to bid for the contract work above mentioned, the plaintiff made the customary reasonable investigation of the site of the work and carefully examined the specifications, schedules and drawings relating to a diversion tunnel included in the contract work. The specifications and drawings provided that the diversion tunnel be 710 feet long, horseshoe shaped, 13 feet in diameter and completely lined with concrete. The contract drawings and Par. TP4-03 of the specifications showed that prior to lining the tunnel with concrete, permanent tunnel protection was to be installed for 50 feet in from each portal, this protection consisting of steel arch ribs covered with corrugated steel liner plates. Paragraph TP4-03 (b) and (c) of the specifications provided that the arch ribs and liner plates should be placed in the tunnel section where tunnel protection is indicated on the drawings or where directed by the Contracting Officer. Nothing in the specifications and drawings or in such investigation of the site as the plaintiff was able to make revealed conditions hereinafter described. As a result of said conditions, plaintiff was required to and did install steel arch ribs and liner plates throughout the entire length of the tunnel. Plaintiff was paid only for the 50 foot permanent tunnel protection installed at the inlet and outlet portals. Plaintiff seeks compensation for the additional work done and reimbursement for the increased costs occasioned by Govern-

ment delays and other increased costs hereinafter referred to.

6. The specifications, schedules and drawings contemplated the nature of the rock throughout the tunnel, except for a length extending 50 feet from each portal, to be of such a character that after the tunnel was holed through, the roof thereof would be sufficiently stable to [fol. 4] be self-supporting without the necessity of installing permanent tunnel protection before the installation of the concrete lining.

7. The provisions of the specifications pertinent to the installation of permanent tunnel protection are as follows:

> "TP4-03. *Tunnel Protection. a. Scope.* Tunnel protection shall be furnished and placed as required for distances of approximately the first 50 feet at each end of the tunnel which includes the underground portion of the outlet transition. Such tunnel protection conforming to the cross sectional shape of the tunnel and transition, shall consist of steel arch ribs and corrugated steel liner plates as indicated on the drawings or required, including tie rods and spreaders. Liner plates shall be placed before the setting of ribs. In erecting, each arch rib shall be properly spaced, set to the designated grade and alignment, and in a position normal to the tunnel axis. Each rib shall be connected to each successive one by seven (7) sets of steel tie rods and pipe spreaders, uniformly spaced. The contractor shall submit detailed drawings indicating fabrication, splicing of ribs and erection methods of the proposed tunnel protection. No material delivery shall be made prior to receipt of the Contracting Officer's written approval but such approval shall not relieve the Contractor of his sole responsibility for damage resulting from the inadequacy or lack of such protection. Steel for arch ribs, liner and splice plates, tie rods and other items necessary to tunnel protection shall be commercial products and shapes having the necessary physical and chemical qualities for the intended purpose and shall be fabricated according to the best standard

practice. The erection of such tunnel protection shall
[fol. 5] be carried as close to heading blasting as is feasible without undue damage to tunnel protection in place.

b. Steel Tunnel Protection Supports. Steel arch rib tunnel protection supports shall be erected in the tunnel sections where tunnel protection is indicated on the drawings *or directed by the Contracting Officer* and shall be steel I-beams of the size, weight and length, and bent to the shape indicated on the drawings. The maximum center to center spacing shall be as designated. Suitable dowels shall be provided at the invert to maintain foot of ribs in proper position. Tie rods and spreaders shall be installed at the same time ribs are set. Blocking and other timber required for erection shall be furnished by the Contractor. Arch rib splicing, limited to two for each rib, shall develop the full strength of the rib. Steel ribs shall be left in place and embedded in the concrete tunnel lining.

c. Steel Liner Plates. Steel liner plates for tunnel protection shall be placed in the tunnel sections, where such protection material is indicated on the drawings or *directed*, to furnish coverage for the tunnel roof section above the spring line. The ends of plates in adjoining rows shall be staggered and half plates furnished where necessary for this purpose. Liner plates shall be left in place and have concrete tunnel lining placed against their inner surfaces. Liner plates shall be fabricated corrugated steel plates not less than number three (3) gauge, bent to the designated radius and pressed into the required shape consisting of integral side with square corners and the elongated holes for connecting bolts, similar and equal to Armco Type 18-inch section.

TP4-08. *b. Tunnel Protection.* Payment for all costs of furnishing and placing liner plates, and tunnel supports, including tie rods and pipe spreaders, specified herein *or directed by the Contracting*

[fol. 6] *Officer*, will be made at the applicable contract unit price for 'Steel Liner Plates', Item No. 11 and 'Steel Tunnel Supports,' Item No. 12. Partial payments will be made according to paragraph TP 11-14." (italics ours)

The drawings also specify where the permanent tunnel protection at both the inlet and outlet portals is to be placed.

8. From the foregoing data pertaining to permanent tunnel protection the plaintiff contends that the Government designers must have concluded, on the basis of their sub-surface and other investigations, that the nature of the rock which would be encountered in the boring of the tunnel was such that permanent tunnel protection consisting of steel ribs and liner plates would not be required beyond the 50 foot limits specified. Had the conclusion been otherwise, permanent tunnel protection would have been specified throughout the length of the tunnel.

9. Contrary to what would reasonably be expected from the data furnished by the Government, indicated in the contract specifications, schedules and drawings, it was found by the plaintiff in performing the contract that the rock actually encountered was unstable and caused heavy rock falls quite generally distributed throughout the tunnel, thereby requiring the plaintiff, to install permanent tunnel protection of the type designated in TP4-03 of the specifications in order to place the concrete lining and complete the tunnel in accordance with the contract.

10. The sub-surface conditions encountered, hereinafter more particularly described, created a changed condition [fol. 7] under Article 4 of the contract, entitled "Changed Conditions", which reads as follows:

> "ARTICLE 4. Changed conditions.—Should the contractor enocunter, or the Government discover, during the progress of the work subsurface and/or latent conditions at the site materially differing from those shown on the drawings or indicated in the specifications, or unknown conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inhering in work

of the character provided for in the plans and specifications, the attention of the contracting officer shall be called immediately to such conditions before they are disturbed. The Contracting Officer shall thereupon promptly investigate the conditions, and if he finds that they do so materially differ the contract shall with the written approval of the Secretary of War or his duly authorized representative, be modified to provide for any increase or decrease of cost and/or difference in time resulting from such conditions."

11. The driving of the diversion tunnel began at the outlet end on December 12, 1946. Prior to this time, in October 1946, in open cut excavation for the outlet works and stilling basin, vertical intersecting fractures in the rock had been exposed containing clay or mud seams which were later found throughout the tunnel. These characteristics indicated the probability that the roof of the tunnel would not be stable. There was nothing contained in the data supplied in the contract, specifications, schedules or drawings to indicate the presence of vertical intersecting fractures in the sub-surface rock, nor did plaintiff's examination conducted at the site disclose any such condition. Rock of the same unsuitable charac- [fol. 8] teristics as that uncovered in the stilling basin was encountered in the area of tunnel excavation as the work progressed. The need for additional permanent tunnel protection on account of this unforeseen condition was promptly called to the attention of the Government through its Resident Engineer.

Permission to install permanent tunnel protection was refused. However, temporary tunnel protection was authorized beyond 50 feet at the inlet portal by the utilization of four steel ribs which later were to be removed and used at the outlet portal. On this basis, plaintiff proceeded with the boring of the tunnel. The four steel ribs were installed and afforded 16 feet of additional protection beyond the 50 feet of permanent portal protection specifically provided for in the contract. When this additional temporary protection was later removed, substantial rock falls from the roof occurred.

12. The tunnel was completely holed through by March 10, 1947 and cleanup work commenced immediately. Between March 12th and April 25th there were substantial rock falls from the roof of the tunnel, which occurred at many places in the tunnel where there were intersecting fractures in the rock. Subsequent to April 25th additional rock falls occurred.

13. After plaintiff discovered the substantial rock falls that had occurred on account of the unstable condition of the sub-surface rock, plaintiff by letter dated April 23, 1947 called this condition to the attention of the Government and again requested authorization to install permanent tunnel protection throughout the tunnel at the Government's expense, stating in substance that as a re- [fol. 9] sult of the failure of the Government to authorize the installation of permanent tunnel protection during the progress of excavation, there had developed large areas where the tunnel roof had failed and that such authorization was again requested in view of the then known facts, which were unforeseen by either party at the time the contract was entered into. The Contracting Officer, upon his attention being called as aforesaid, to such unforeseen, unstable sub-surface conditions, advised the plaintiff by letter dated May 5, 1947 that no further tunnel protection would be placed at the expense of the Government. The Contracting Officer based his denial of the request of the plaintiff for permanent tunnel protection at the expense of the Government upon findings which were conclusions of law involving construction of the provisions of the contract and specifications relating to permanent tunnel protection to be installed, to temporary tunnel protection to be provided by plaintiff and to the fact that plaintiff, by acceptance of the contract, indicated that it had satisfied itself as to sub-surface conditions. The Contracting Officer's letter of May 5, 1947 also advised plaintiff of its rights to appeal from his decision as provided under the terms of Article 15 of the contract. From said determination of the Contracting Officer plaintiff filed a timely appeal, hereinafter referred to, under Article 15 of the Contract, such appeal being dated May 29, 1947.

14. Despite his decision of May 5, 1947, the Contract-

ing Officer and Resident Engineer entered into conferences and extensive correspondence with plaintiff with respect to the minimum permanent tunnel protection required before installation of the concrete lining. At the first conference held on May 12, 1947, in response to the request of plaintiff that the Contracting Officer give it an [fol. 10] indication of the type and character of tunnel protection required, the Contracting Officer requested that plaintiff submit for approval a description of the minimum tunnel protection which it would recommend. In accordance with this request, plaintiff consulted with independent engineers and advised the Contracting Officer that in its considered opinion and that of its consultants the minimum permanent tunnel protection which would overcome the falling roof of the tunnel would be the installation of steel ribs and liner plates, such as were used at the portals, throughout the length of the tunnel. Several weeks thereafter the Contracting officer submitted to plaintiff for its consideration an alternative tunnel protection which he termed temporary tunnel protection, asserting that it would be adequate to support the falling rock load as well as the material used in backpacking. Plaintiff, after consideration of the alternative design and consultations with independent engineers with respect thereto, advised the Contracting Officer that in their opinion the alternative design was inadequate and that the minimum protection required throughout the tunnel was that of the type installed at both portals. Plaintiff reiterated its request that the Contracting Officer give consideration and approval of such design for permanent tunnel protection. By letter dated August 11, 1947, the Contracting Officer informed plaintiff that there was no objection to the installation throughout the tunnel of the steel ribs and liner plates proposed by plaintiff, but that the costs of such installation were to be borne by plaintiff who was required to furnish temporary tunnel protection in accordance with the provisions of Paragraph TP4-02 of the specifications.

[fol. 11] 15. Plaintiff, while protesting by letter dated August 15, 1947 the Government's refusal to bear the costs of permanent tunnel protection, nevertheless promptly

upon receipt of the Contracting Officer's letter of August 11, 1947 proceeded to install the steel arch ribs and liner plates. Such installation was completed in December, 1947 and the plaintiff thereupon proceeded to line the tunnel with concrete in accordance with the terms of the contract. The concrete lining was completed in May, 1948.

16. Under the terms of the contract, all of the work was to be completed by January 15, 1949. The actual completion date was June 30, 1949. Such delay resulted from the Government's protracted negotiations in connection with the determination of the necessary minimum permanent tunnel protection required. As a consequence thereof, plaintiff's work in the performance of the contract was delayed, impeded and hindered so that the concrete work was required to be done in the winter months of 1947-1948. Such delays resulted in the additional increased costs and loss to plaintiff hereinafter specified.

17. On account of the changed sub-surface conditions encountered by plaintiff requiring the installation of permanent tunnel protection and other matters heretofore alleged plaintiff claims reimbursement for the additional expenses incurred by it in installing such permanent tunnel protection by the use of steel arch ribs and steel liner plates throughout the entire length of the tunnel and the additional costs occasioned by the delays caused by the Government.

18. Plaintiff further in the alternative alleges that the provisions in the specifications set forth in Paragraph [fol. 12] 7 hereof, particularly the italicized portions thereof, contemplated that the Contracting Officer would and should order and pay for permanent tunnel protection beyond that shown on the drawings if conditions encountered were such that good engineering practice required such protection to permit the concrete lining to be installed without substantial risk of injury or damage to the work from falling rock. The temporary tunnel protection which the contractor was required to provide by Paragraph TP4-02 of the specifications entitled "TUNNEL EXCAVATION," as properly interpreted, is re-

movable supports of the character required to safeguard workmen during the excavation of the tunnel, and does not include steel supports needed to permit installation of the permanent concrete lining, which must necessarily be left permanently in place.

19. The faulty nature of the rock encountered and the rock falls resulting therefrom required the installation of steel arch ribs and liner plates throughout the entire length of the tunnel, and by virtue of the facts and circumstances heretofore alleged the Government was obligated to order and pay for such permanent tunnel protection under Paragraphs TP4-03 and TP4-08 of the specifications, as good engineering practices required such installation in order that the concreting of the tunnel be accomplished. The Contracting Officer unreasonably and unlawfully withheld permission for plaintiff to make such installation at the expense of the Government.

20. As alleged in paragraph 13 hereof, plaintiff appealed within the time limits prescribed by the contract from the adverse decision of the Contracting Officer. [fol. 13] This appeal was referred to the Corps of Engineers Claims and Appeals Board, the duly authorized representative of the Secretary of War. Hearing was held June 17, 1948 and an adverse decision was rendered in connection therewith on December 13, 1948. A motion for rehearing of the determination by the Board denying plaintiff's appeal was filed on or about December 20, 1948. The motion for a rehearing was denied by the Board by an order dated January 4, 1949. Plaintiff has exhausted its administrative remedies. Neither the Contracting Officer nor the said Appeals Board has correctly evaluated the evidence, and no appropriate relief was granted plaintiff for the additional work performed under the contract, occasioned either by the changed conditions referred to in Article 4 of the contract, or by the Government's breach of the contract in failing to direct the installation of permanent tunnel protection throughout the entire length of the tunnel at Government expense in conformity with good engineering practice. The decision of the Contracting Officer, and in turn that of the

Claims and Appeals Board, acting for the head of the War Department, were capricious or arbitrary or so grossly erroneous as necessarily to imply bad faith, or were not supported by substantial evidence.

21. As alleged in Paragraph 13 hereof, the adverse decision of the Contracting Officer was based on questions of law. Many issues raised in this complaint, particularly those in Paragraphs 6, 7, 8, 16, 18 and 19 hereof, relate to questions of law involving interpretations of the contract and specifications and breach of implied obligations of the Government under the contract with respect to which Article 15 of the contract does not provide for any appeal or any finality.

[fol. 14] 22. There is set forth in Exhibit A, attached hereto, and made a part hereof, a schedule of plaintiff's increased costs, totaling $233,425.75, which increased costs were occasioned by the changed conditions referred to in Article 4 of the contract requiring the installation of permanent tunnel protection throughout the entire length of the tunnel and by the delays caused by the Government or occasioned by the Government's failure and refusal, in violation of the contract, to direct the installation of permanent tunnel protection at Government expense under the circumstances heretofore alleged. Plaintiff has been damaged by nonpayment of its aforementioned claims to at least the amount of $233,425.75, plus an allowance for profit on Items 1 to 8 inclusive listed in Exhibit "A" attached hereto totaling $175,307.50, or $26,296.12 (15% thereof), which the plaintiff avers to be reasonable and proper, making the aggregate claim of the plaintiff herein the sum of $259,721.87, together with interest thereon, exclusive of all set-offs and just grounds of defense, which amount plaintiff is justly entitled to recover from the United States of America, the defendant herein.

23. The plaintiff is the sole owner of said claim and is the only party interested therein, and the plaintiff says that no asignment or transfer of said claim or of any part thereof or of any interest therein, has ever been made to anyone, and that the plaintiff is fully entitled to recover from the United States of America the entire amount of its claim as set forth above.

WHEREFORE, the plaintiff prays judgment against the United States of America in the sum of $259,721.87, [fol. 15] with interest thereon as may be provided by law, and for such other and further relief as the nature of the case may require and to the Court may seem just and proper.

ROBERT W. KNOX
821 15th Street, N. W.
Washington 5, D. C.
Attorney for Plaintiff

ROBERT F. BRADFORD
WILLIAMS H. MATTHEWS
Of Counsel

* * * *

Duly Sworn to by Robert W. Knox
Jurat Omitted in Printing

[fol. 16] EXHIBIT A TO PETITION

Schedule of Plaintiff's Increased Costs

1.	Cost of Removing Extra Overbreak During Original Tunnel Driving	$ 1,092.75
2.	Cost of Removing Fallen Rock and Extra Rock to Invert Subsequent to Completion of Tunnel Driving (March 25, 1947)	9,018.00
3.	Permanent Tunnel Supports Installed After March 25, 1947	29,354.51
4.	Backpacking Installation	24,979.15
5.	Additional Concrete Placed	11,200.00
6.	Heating Costs—Winter Concrete	45,853.08
7.	Loss of Efficiency—Winter Concrete	18,560.00
8.	Excess Supervisory, Engineering and Administrative Labor—period 1-16-49 thru 6/30/49	35,250.01
9.	Cost of principal Items of Plant and Equipment used and Maintained on Contract after 1-16-49	58,118.25
		$233,425.75

[fol. 17] IN THE
UNITED STATES COURT OF CLAIMS

No. 466-54

CARLO BIANCHI & CO., INC., PLAINTIFF

v.

THE UNITED STATES, DEFENDANT

DEFENDANT'S ANSWER—Filed May 31, 1955

1. Denied for lack of knowledge or information sufficient to form a belief, except that it is admitted that plaintiff represented itself to, and contracted with defendant, as the corporation described.

2. The material allegations are denied except as hereinafter admitted or admitted with qualifications.

3. Admitted.

4. Admitted, except the allegation that the Government accepted the work as completed on August 22, 1949, which is denied.

5. First sentence: Denied for lack of knowledge or information sufficient to form a belief, but it is admitted that the Invitation for Bids required bidders to carefully examine the drawings and specifications, to visit the site of the work, and to fully inform themselves with respect to all conditions affecting the work and the cost thereof.

[fol. 18] Second, third and fourth sentences: Admitted.

Fifth and sixth sentences: Denied.

Seventh sentence: Denied, except that it is admitted that plaintiff was paid the contract price which included temporary tunnel protection and was not paid extra for installing permanent tunnel protection beyond the contract requirements, approximately the first fifty feet at each end of the tunnel and extending inward, or as otherwise agreed to.

Eighth sentence: All material allegations are denied.

6. Denied, except that it is admitted that the specifications, schedules, and drawings required the installation of permanent tunnel protection extending approximately fifty feet from each portal only, as described in paragraph TP4-03 of the specifications, and also required temporary tunnel protection where needed.

7. Admitted, except that it is denied that all the pertinent specifications are quoted or that the quotations were italicized as set forth.

8. First sentence: This is a statement of plaintiff's contention calling neither for affirmation or denial.

Second sentence: Denied.

9. Denied.

10. Denied, except that it is admitted that the contract contained Article 4, on "Changed Conditions".

11. First sentence: Admitted.

Second sentence: Admitted except that it is denied that vertical intersecting fractures in the rock containing clay or mud seams were found throughout the tunnel. In making the rock cut for the tunnel outlet and stilling basin plaintiff's rock excavation disclosed mud seams. No claim was made that this was a changed condition under Article 4. In December 1946 the Contracting Of- [fol. 19] ficer found that the exposed rock surfaces indicated the same type of materials described in the contract drawings, and he so found. Plaintiff did not appeal.

Third sentence: Denied.

Fourth sentence: Denied, except the allegation pertaining to plaintiff's examination which is denied for lack of knowledge or information sufficient to form a belief. Fractures and joints in nearby outcroppings were apparent upon proper examination of the site.

Fifth sentence: Denied except as elsewhere admitted.

Sixth sentence: Denied.

Seventh sentence: Admitted that permission to install permanent tunnel protection at defendant's expense was refused.

Eighth and ninth sentences: Denied. Temporary tunnel protection was required by the contract and utilized four steel ribs for this purpose.

Tenth and eleventh sentences: Denied, except that it is admitted that four steel ribs were installed and afforded 16 feet of temporary protection beyond the fifty feet of permanent protection, and that when said temporary protection was removed, some rock fall occurred.

12. Denied, except that it is admitted that the tunnel was completely holed through by March 10, 1947 and that cleanup work was in progress shortly thereafter. It is also admitted that rock falls occurred between March 12 and April 25, 1947, and after April 25, 1947 at places where there were intersecting fractures in the rock. Defendant denies that this constituted a changed condition, that the rock falls were excessive, or that they [fol. 20] would have occurred if plaintiff had complied with the contract requirements.

13. Denied, except as admitted herein. Many months prior to April 23, 1947 there were conferences and correspondence between plaintiff's and defendant's representatives relative to tunnel protection and sub-surface conditions. By letter dated April 10, 1947 plaintiff proposed that permanent tunnel protection be extended throughout the tunnel instead of at the ends only, because of possible hazards to its workmen, and requested payment therefor. The Assistant Resident Engineer promptly called plaintiff's attention to the Resident Engineer's decision and to the contractor's responsibility for temporary tunnel protection and for the safety of the workmen and the work, and declined to authorize installation of permanent protection at defendant's expense.

By letter dated April 23, 1947 plaintiff wrote the Resident Engineer as follows:

> We have received a letter dated April 15, 1947, from Mr. Dale A. Losey, Assistant Resident Engineer, in reply to ours of April 10, 1947, on the above subject.
>
> We wish to point out that the request contained in our letter of April 10 does not concern itself with the matter of temporary tunnel protection; it is concerned wholly with the permanent type of

tunnel protection as described in the contract specifications paragraph TP4-03.

The specifications clearly indicate that the Government intended installation of permanent steel supports and liner plates to a distance of 50 feet
[fol. 21] in from each end of the tunnel and for such additional distance as conditions would require.

Ever since the start of rock excavation work on this project, and even prior to the time when the actual tunnel excavation was started, the question of the character of the rock that would be encountered in the tunnel has been the subject of discussions with the Resident Engineer and his staff. These discussions were participated in by our subcontractor, Cabot Construction Corporation, as well as ourselves. We consistently maintained the position that the character of the rock within the tunnel was such that provision should be made for permanent tunnel protection. The Resident Engineer took the position that the permanent tunnel protection would be authorized only for 50 feet from each end.

In view of the position taken by the Government, the subcontractor was required to proceed with the excavation of the tunnel without the installation of permanent tunnel protection, employing temporary tunnel protection of its own devising in order to afford the necessary protection for its workmen.

As a result of the failure of the Government to authorize the installation of permanent tunnel protection during the progress of excavation, there have now developed large areas where the tunnel roof has disintegrated or failed, and there are piles of dislocated material on the floor of the tunnel.

In view of the now known facts with reference to the dislodgment or failure of large areas of the tunnel roof, a condition which could have been anticipated and prevented had the Government ac-
[fol. 22] ceded to our request for permanent tunnel protection, we now again request that the Govern-

ment authorize the installation of the permanent tunnel protection, together with the necessary and obvious corrective measures incidental thereto, at the Government's expense.

May we have the courtesy of a prompt reply granting to us the above-requested authorization?

A copy of this letter was also directed to the War Department, attention of Col. J. S. Seybold, District Engineer, at Baltimore, Maryland.

By letter dated May 5, 1947, Col. Seybold wrote plaintiff as follows:

Reference is made to your contract number W-30-180-eng-397, providing for construction of Almond Dam at Almond, New York, and to your letter dated 23 April 1947 inclosing for my consideration your letter of even date addressed to my Resident Engineer requesting an authorization to place at contract prices additional permanent protection in the tunnel.

I have caused an examination to be made of the contract documents and the circumstances and events that have preceded your request and I have found as follows:

a. Contract drawing sheet No. 7 shows foundation exploration data that indicates the type and character of the material that would be encountered during the tunnel driving and lining operation.

b. Paragraph SC-7a of the specifications notified all parties interested in this project that samples of the materials removed from the foundation ex-

[fol. 23] plóration holes were available for inspection at the U. S. Engineer Soils Laboratory at Ithaca, New York.

C. Paragraph GC-3 of the specifications annotated for the information of prospective bidders, certain items of consequence with respect to site and job conditions. Your acceptance of the contract indicates that you have satisfied yourself as to those conditions including subsurface conditions.

d. Contract drawing sheet No. 24 clearly indicates tunnel protection 50 feet back from the face of each portal of the tunnel.

e. Paragraphs TP4-03(a) and (c) of the specifications also describes and indicates the limits of tunnel protection "as required for distances of approximately 50 feet at each end of the tunnel." This limitation to hold unless directed otherwise.

f. Paragraph TP4-02 of the specifications contains a statement that "temporary tunnel protection shall be provided where required for safety of the workman."

Under the terms of the contractual requirements cited above, I consider that the Government clearly and in a very exact manner indicated the extent to which the Government would require and assume payment for permanent tunnel lining. I also consider that sufficient data was available for you to make a proper consideration of the tunnel protection which would be necessary for you to install in order to provide adequate protection against damage to completed work as well as the safety of your workmen.

A review of the records of my Resident Engineer indicates that he consulted with your representa-
[fol. 24] tive prior to the commencement of the tunnel work and advised you fully and correctly as to the extent of both the Government's responsibility and your responsibility in placing tunnel lining beyond the limits required and indicated for payment.

Interim correspondence indicates that you were periodically aware of the gradual deterioration of the rock in the tunnel which did not commence until the tunnel was completely holed out, yet you apparently took no action to protect either yourself or the interest of the Government.

It is my decision, in view of the above finding, that no further tunnel lining will be placed at the expense of the Government. Furthermore, my Resident Forces will be instructed to require that adequate precautions be taken to insure the safety of

all personnel when your tunnel operations are resumed.

If you wish to appeal my decision in the matter, you are advised of your rights of appeal within 30 days from date of receipt of this letter as provided under the terms of Article 15 of the contract.

On or about May 12, 1947, the contracting officer and plaintiff's representatives conferred at Baltimore, and thereafter by letter dated May 29, 1947 plaintiff appealed to the Secretary of War.

14. Denied, for lack of knowledge or information sufficient to form a belief, except as admitted herein. Under date of May 12, 1947, plaintiff's representatives conferred with Col. Seybold at Baltimore and endeavored to obtain authority to install permanent tunnel protection throughout at Government expense. May 26, 1947, plaintiff also wrote to Contracting Officer that it con- [fol. 25] sidered the minimum permanent tunnel protection necessary was that the protection installed at the portals be extended throughout the tunnel. Under date of June 13, 1947, Col. Seybold replied as follows:

Reference is made to your letter dated 26 May 1947 wherein you submit a proposal for the safe protection of your workmen in the tunnel at Almond Dam under your Contract No. W-30-180-eng-397.

Your request refers to "Permanent Tunnel Protection". You are advised that no permanent tunnel protection will be required to be installed in Almond Dam Tunnel in addition to that protection already installed and paid for under contract payment items numbers 11 and 12. Also, you are advised that "Permanent Tunnel Protection" required under this contract is at the portals only and is protection designed to withstand earth pressures.

Temporary tunnel protection as required under the provisions of paragraph TP4-02 of the contract specifications is temporary in that its only function is to support a falling rock load and prevent injury to your workmen. The greatest load to which it

will be subjected will be the dead load of the back packed materials.

In paragraph 3 of your letter, you state that you are of the opinion that the minimum permanent tunnel protection that will meet the requirements of the situation adequately and for which you request approval are the same ribs and liner plates used at the portals. If you desire to use this design of tunnel protection throughout the tunnel length, its
[fol. 26] use is approved. You are advised, however, that this type of installation is considered as an over design for the purpose required and will be a more costly installation to you that is considered necessary.

It is suggested and recommended to you that adequate temporary protection may be obtained by using I-beam ribs of about 3 inches and 6 pound weight spaced 4 to 8 feet apart (depending on the overbreak) with 2" timber lagging. The void area in the arch would then be uniformly packed with shale or bank run gravel in a manner to insure a uniform load distribution. Protection of this kind will be adequate to support the falling rock load as well as the material used in back packing. Favorable consideration will be given to a proposal of comparable design.

It might be called to your attention that a scheme similar to the above was proposed to my Resident Engineer by a representative of your subcontractor, the Cabot Construction Company, at the time tunnel excavation was commenced.

It is to be understood that the contents of this letter are not to be construed as a reversal of my decision to you dated 5 May 1947 to the affect that no payment would be made by the Government for the additional tunnel protection required to complete work under your contract.

Under date of June 23, 1947 plaintiff by Peter M. Bianchi wrote Col. Seybold as follows:

> We have your letter of June 13, 1947 in reply to ours of May 26, 1947 on the subject of Tunnel Protection.

[fol. 27] You are advised that nowhere in our letter did we make reference to the subject of safe protection of workmen in relation to Tunnel Protection.

We understand that you have decided that no Tunnel Protection will be required, and to this position we have taken exception by our letter of appeal to the Secretary of War, Washington, D. C., dated May 29, 1947.

We assume that your reference is to earth pressures resulting from rock or other materials surrounding the tunnel bore.

We cannot agree with the statement in regard to temporary Tunnel Protection in the third paragraph of your letter.

We cannot agree with your position in regard to the design of Tunnel Protection as we are of the opinion that the conditions require an installation at least of such strength as used at the portals. We are proceeding to order this material and will install it at the earliest possible moment on the assumption that this procedure is acceptable as stated in the fourth paragraph of your letter of June 13.

In reference to the next to the last paragraph of your letter to the effect that a scheme for temporary protection similar to that suggested by your letter was proposed to the Resident Engineer by a representative of the Cabot Construction Corporation, please be advised that this is not consistent with the statement made to us by the Cabot Construction Corporation, to whom the matter was referred.

It is understood that the contents of this letter
[fol. 28] are not to be construed as waiving any of our rights involved in our appeal of May 29, 1947.

Under date of July 25, 1947, plaintiff wrote the District Engineer that plaintiff intended to install tunnel protection of its design as an extra under the contract.

Under date of August 11, 1947, the Acting District Engineer replied to plaintiff as follows:

Reference is made to your letters dated 25 July 1947 and 1 August 1947 relative to the temporary

tunnel protection which you propose to install under your Contract Number W-30-180-eng-397 which provides for the construction of Almond Dam at Almond Dam, New York.

By letter dated 5 May 1947 you were furnished a decision by Colonel J. S. Seybold, then District Engineer, to the effect that the tunnel protection remaining under your contract would consist of temporary protection placed in accordance with paragraph TP4-02 of the contract specifications as a safety precaution for the workmen at no additional cost to the Government. You have appealed this decision of the District Engineer in accordance with the terms of the contract. Subsequent to your appeal you had offered for approval a proposed plan of protection, the merits and necessity for which were clearly discussed in a letter to you from the District Engineer dated 13 June 1947.

Your letter dated 25 July 1947 outlines again the plan of protection which you are electing to use. You also express your views with respect to probable differences in cost between your proposed plan and the scheme suggested by this office as adequate.

[fol. 29] Your letter cites the interests of the Government in the matter as an extra and infers a liability for costs on the part of the Government. It becomes necessary, therefore, to advise you that the decision of the District Engineer and your subsequent appeal will be reviewed and a final decision rendered by higher authority as soon as an orderly processing of your appeal can be accomplished. In the meantime, severe inexcusable delays to the work are resulting from your failure to proceed and it is not believed that your interests will be furthered by continuing correspondence on the matter.

The Government position has been made clear in the previous correspondence and is summarized briefly as follows:

a. In accordance with paragraph TP4-02 of the contract specifications "temporary tunnel protection shall be provided where required for safety of

the workmen". The installation of this temporary protection is not structurally necessary to insure the safety of the completed tunnel structure and need be designed only to support a falling stone load and backfilled material in the tunnel overbreak area. The design suggested by this office is considered adequate for that purpose and will be approved for use if you wish to reconsider our plan. However, since the safety of your workmen is your responsibility you must, of course, provide a protection which you consider adequate for their safety, therefore, no objection will be made to the protection plan which you propose to use. Under the terms of the contract all costs will be accrued to you unless found otherwise by higher authority.

[fol. 30] Plaintiff failed to proceed with the installation and completion of the concrete tunnel lining during all of this period as required by the contract, but delayed commencement until December 1947.

15. Admitted, except the allegations that plaintiff proceeded promptly, and completed the installation of the steel arch ribs and liner plates in December 1947, which are denied.

16. Denied, except as admitted herein. The contract requirement of completion by January 15, 1949 was extended to June 30, 1949.

17. All material allegations are denied.

18. Denied.

19. Denied.

20. First, second and third sentences: Admitted.

Fourth and fifth sentences: Admitted except that defendant avers that a motion for rehearing was entertained, and the decision of December 9, 1948 reaffirmed.

Sixth sentence: This is a conclusion of law, but is otherwise denied.'

Seventh sentence: Denied.

Eighth sentence: Denied.

21. The allegations in this paragraph are argumentative. All material allegations of fact are denied.

22. All material allegations of fact are denied.

23. Denied, for lack of knowledge or information sufficient to form a belief, except the allegation that plaintiff is fully entitled to recover, which is denied. Defendant alleges on information and belief that plaintiff assigned all moneys due or to become due under the contract to the National Shawmut Bank of Boston, Massachusetts on September 26, 1946.

24. Defendant specifically denies that plaintiff com- [fol. 31] plied with Article 4 of the contract entitled "Changed Conditions". Denies liability for any increased costs incurred by any subcontractor of plaintiff for which plaintiff was not itself obligated to the subcontractor.

25. Denies each and every allegation of the petition not herein expressly admitted, or admitted with qualifications.

WHEREFORE defendant demands judgment that the petition be dismissed with all costs taxed against plaintiff.

WARREN E. BURGER,
Assistant Attorney General,
Civil Division.

EDWARD L. METZLER,
Attorney, Civil Division,
Department of Justice.

[fol. 1] IN THE
UNITED STATES COURT OF CLAIMS

No. 466-54

CARLO BIANCHI AND COMPANY, INC., PLAINTIFF

vs.

UNITED STATES OF AMERICA, DEFENDANT

Boston, Massachusetts,
Monday, September 24, 1956,
10:00 o'clock a.m.

TESTIMONY FOR PLAINTIFFS AND DEFENDANT

The parties met, pursuant to notice of the Commissioner, at the time above stated, in Court Room 4, 12th Floor, Federal Building, Boston, Massachusetts.

Present: Hon. William E. Day, Commissioner;

APPEARANCES

Robert W. Knox, Esq.,
William H. Matthews, Esq., and
Robert F. Bradford, Esq., counsel for plaintiff;

E. L. Metzler, Esq., counsel for defendant.

Mr. Kenneth K. Johnston and Mr. D. F. King, reporters, were thereupon sworn by the Commissioner to well and truly take down and transcribe the questions propounded to and the answers given by the witnesses, and to do all other things required of them by the Commissioner.

Pursuant to the order of reference by the Honorable, the United States Court of Claims, in the above-entitled [fol. 2] cause, testimony on behalf of the Plaintiff was taken as follows:

TESTIMONY FOR PLAINTIFF

COMMISSIONER DAY: You may proceed, gentlemen.

MR. KNOX: Mr. Commissioner, with your permission I would like to make an opening statement outlining as briefly as possible the issues involved in this suit and the Plaintiff's position and contentions in connection therewith.

OPENING STATEMENT BY COUNSEL FOR PLAINTIFF

MR. KNOX: The Plaintiff, Carlo Bianchi and Company, Inc., a Massachusetts corporation, bid and was awarded on or about July 3, 1946, Contract W-30-180-eng-397 by the Corps of Engineers, U.S. Army Appropriation Flood Control for the construction of an earthen dam and diversion tunnel at Almond, Steuben County, New York. The contract was on a unit price basis for an estimated consideration of $3,330,330.00. The contract provided that the work was to be commenced within ten calendar days after date of receipt by the Contractor of notice to proceed. Notice to proceed was received July 30, 1946 and Plaintiff complied therewith. The contract provided that the work was to be completed not later than 900 calendar days after receipt of notice to proceed. This time was subsequently extended and the work was completed on June 30, 1949.

The issues involved in this suit concern solely the diversion tunnel. The Plaintiff upon receiving the invita- [fol. 3] tion to bid made an investigation of the site, examined the specifications, the logs of the borings, the schedules and drawings relating to the dam and the diversion tunnel. These specifications and drawings provided that the diversion tunnel would be 710 feet long, horseshoe shaped, 13 feet in diameter, and completely lined with concrete after the tunnel was bored through.

The specifications, drawings and logs represented to the Plaintiff that subsurface conditions in the excavation of the tunnel would be such that the roof of the tunnel would be stable and would not require permanent tunnel protection beyond 50 feet at the inlet and outlet portals. The specifications provided that for 50 feet in from each portal steel arch ribs and steel liner plates were to be installed and that such tunnel protection should be

installed elsewhere as directed by the Contracting Officer. The condition as represented by Defendant was not found and due to the unstable roof of the tunnel when completely bored through the Plaintiff was required to and did install steel arch ribs and the liner plates throughout the entire length of the tunnel. It was not possible for the Plaintiff to install the concrete lining without first installing permanent tunnel protection. The roof of the tunnel was unstable primarily due to vertical intersecting fractures with clay lining found in the shale of the tunnel. Nothing in the specifications, logs or drawings, or the investigation of the site as the Plain-
[fol. 4] tiff was able to make, revealed these conditions.

The Plaintiff's position is that the conditions which were found during the course of the excavation of the Almond Dam Tunnel and when the tunnel was "holed through" materially differed from those shown on the drawings or indicated in the specifications and constituted changed conditions within Article 4 of the Contract. The subsurface latent conditions which materially differed from those represented were promptly called to the attention of the Resident Engineer and the Contracting Officer. In fact, such conditions were called to the Resident Engineer's attention during the excavation of the stilling basin by pointing out the possibility that the vertical intersecting fractures with clay lining found therein might reasonably be expected to be found in the tunnel when the excavation was under way. The Resident Engineer took the position that the rock that would be found during the excavation of the tunnel would be more sound and that the roof of the tunnel would be stable. When the tunnel was completely "holed through" the entire roof of the tunnel was unstable and required permanent tunnel protection. The tunnel was completely driven through by March 1947; the clean-up work was completed in the same month. Immediately thereafter there were substantial rock falls from the roof of the tunnel occurring at many places where the intersecting fractures existed. It then became apparent that the
[fol. 5] roof of the tunnel was unstable and could not without permanent tunnel protection be concreted suc-

cessfully and the contract completed. This condition was called to the attention of the Resident Engineer and the Contracting Officer. The Contracting Officer on May 5, 1947 denied the existence of this condition and refused to permit the Contractor to install permanent tunnel protection at the Defendant's expense. Subsequently and within the period of time provided in the Contract, the Plaintiff appealed from this decision.

Despite the decision of May 5 and the subsequent appeal the Contracting Officer and the Resident Engineer entered into numerous conferences and extensive correspondence with the Plaintiff with respect to minimum permanent tunnel protection to be installed before the installation of the concrete lining. These conferences and discussions took place over quite a period of time, and a proposal was submitted by the Contracting Officer to the Plaintiff as to what he considered would be proper tunnel protection. He requested the Plaintiff to consider and advise him whether the alternative design was adequate or inadequate. The Plaintiff engaged several consulting engineers to determine whether or not the proposed tunnel protection submitted by the Contracting Officer was sufficient so that the tunnel could be safely lined with concrete. The opinion of the various consulting engineers [fol. 6] was that the Contracting Officer's proposed plan was inadequate and that the minimum requirement for permanent tunnel protection prior to the lining with concrete would be that proposed by the Plaintiff. The Contracting Officer was promptly advised of this decision by the Plaintiff. By letter of August 11, 1947 the Contracting Officer informed the Plaintiff that there was no objection to the installation throughout the tunnel of the steel ribs and liner plates proposed by the Plaintiff but the cost of this installation would have to be borne by the Plaintiff. The Plaintiff while protesting this action by letter nevertheless promptly proceeded to order and receive delivery and install the steel arch ribs and liner plates. This installation was completed in December 1947 and the Plaintiff thereupon proceeded to line the tunnel with concrete in accordance with the terms of the Contract. The concrete lining was completed in May 1948.

It is Plaintiff's position that not only were the conditions found in the tunnel materially different from those represented in the contract drawings, specifications and logs, but also that under the provisions contained in the specifications the Contracting Officer, in accordance with good engineering practice, should have authorized the installation of the permanent tunnel protection such as was installed by the Plaintiff and that under the terms of the Contract Plaintiff should have been compensated for [fol. 7] such installation. The failure of the Contracting Officer to authorize such tunnel protection was arbitrary and unwarranted and contrary to good engineering practice. Apparently the basis for the position taken by the Contracting Officer was predicated solely upon his interpretation of the Contract and specifications which is a question of law—his interpretation was that any tunnel protection to be installed beyond the 50 feet at the outlet and inlet portals would be temporary protection even though it had to stay in place permanently and that the expense of such protection had to be borne by the Contractor. The only reference to temporary tunnel protection is contained in Paragraph TP4-03 of the specifications entitled "Tunnel Excavation." The type of tunnel support referred to therein is support to safeguard workmen during the excavation of the tunnel. Such support would be removable and could not embrace permanent tunnel protection required to be installed and remain in place permanently in order that the concrete lining could be installed and the Contract completed. The Plaintiff will establish that the tunnel protection which was installed and remained permanently in place had for its purpose the protection of the unstable roof in order that the Contract could be performed by completely lining the tunnel with concrete.

As I have previously stated, the Plaintiff duly appealed to the Corps of Engineers Claims and Appeals [fol. 8] Board from the decision of the Contracting Officer. A hearing was held and an adverse decision rendered, the final order of the Board being issued on January 4, 1949. Plaintiff has exhausted its administrative remedies and takes the position that neither the Contracting Officer nor the Appeals Board has correctly evaluated

the evidence and that the Plaintiff should have been granted relief by reason of the changed conditions pursuant to Article 4 of the Contract or by reason of the Government's failure to authorize the installation of the permanent tunnel protection throughout the entire length of the tunnel at Government expense in conformity with good engineering practice. Thus it is the position of the Plaintiff that the decision of the Contracting Officer and in turn that of the Claims and Appeals Board were capricious or arbitrary, or so grossly erroneous as necessarily to imply bad faith or were not supported by substantial evidence.

I further wish to point out that it is the Plaintiff's position that many of the issues relate to questions of law involving interpretations of the Contract and breach of implied obligations of the Defendant. Plaintiff is seeking in this suit to recover judgment against the Defendant for its increased costs which were incurred through no fault of its own but solely attributable to the actions and inaction of the Defendant.

[fol. 9] COMMISSIONER DAY: Do you wish to reply, Mr. Metzler?

OPENING STATEMENT BY COUNSEL FOR DEFENDANT

MR. METZLER: Mr. Commissioner, I think the pleadings have substantially indicated the issues, and I presume the Commissioner is familiar with them.

The claim as presented to the Engineers Claims and Appeals Board, which acted for the head of the department, pursuant to Article 15 of the Contract, which is the Disputes Clause, was considered under Article 4, the Change Conditions Clause, and that was the basis of the contractor's claim, although there was a disclaimer of intention under Article 4 at the time that the hearing was held before the Engineers Appeal Board.

The contractor seems now, to some extent, to have shifted slightly from its fundamental position taken both before the Appeals Board, and even to some extent in its petition, by endeavoring to present a claim of misrepresentation rather than a claim based strictly on Article 4, which of course was the type that the Engineers

Claims and Appeals Board had been authorized to hear under Article 15, the Disputes Article.

We believe that the law is certainly definitely settled that the decision of the head of the department, under Article 15, is final and conclusive on all questions of fact, and it can be overturned only if it is arbitrary or capricious or not established by substantial evidence. That question has been reviewed by the Court of Claims and by the Supreme Court in many cases.

[fol. 10] So we believe at the threshold that there should be a determination made as to whether that decision of the head of the department, acting through the Claims Appeals Board, was established by substantial evidence or, in substance, that no evidence is admissible in this Court, if that record before the Appeals Board and that decision on which it was based was one where there was substantial evidence which leads to the fact that that conclusion was reasonable. We believe that is the threshold of the determination.

COMMISSIONER DAY: By whom?

MR. METZLER: I say it is one even by the Commissioner.

COMMISSIONER DAY: Of course I have been conscious that there was potential argument, and I believe that that is the kind of thing that should have been taken care of at pre-trial, because, obviously, the record that was made before the Appeals Board and before the contracting officer is one that I should review before I consider the taking of testimony.

MR. METZLER: As the Commissioner knows, we suggest that the issue was one which could be well limited to the issue of liability. We have made that position clear to Plaintiff's counsel, and I believe I have covered that in a letter to the Commissioner, also.

COMMISSIONER DAY: The matter of dividing the case between liability and damages is apart from the matter under consideration here.

[fol. 11] MR. METZLER: That matter could have been well raised at a pre-trial. We had no objection to a pre-trial and raising that issue at any time.

COMMISSIONER DAY: You are making the suggestion now that we should have a determination, first, before we go into the evidence, that the decision was supported by substantial evidence and was not arbitrary?

MR. METZLER: I think that is a perfectly proper determination for the Commissioner to make.

COMMISSIONER DAY: I am suggesting that that should have been done earlier than the date upon which trial has been set.

MR. METZLER: I think it would have been advisable, and we certainly had no objection to that procedure. However, even at this time I do not believe that evidence is properly receivable, unless it is established that that decision was not supported by substantial evidence. I think that the Plaintiff's case before the Court must go only to the question of whether or not that decision was arbitrary, capricious, grossly erroneous, or not supported by substantial evidence.

If that can be done in some manner, then the entire record may be opened up and the issues of damages, and so forth, considered.

It seems to me that the Plaintiff wishes to go beyond that, and in effect not to try the limited issue which the [fol. 12] Court is to consider, but all issues of any character or description.

I will call the Commissioner's attention that it says that Article 4—and I am sure the Commissioner is familiar with that from many cases—is not a misrepresentation article. It is a contract article and provides for adjustment under the contract.

Now during the period from 1946, or early in 1947, the best that can be said, apparently, is that the Plaintiff predicated its claim on a changed condition. That is exemplified by the conduct of the Plaintiff in presenting its claim, and by the hearing before the Appeals Board, where an Article 4 claim was considered.

Now I raise the question whether Plaintiff can now, after having that considered as an Article 4 claim, come in and say: "No, that really isn't our claim. Our claim is a misrepresentation claim."

I believe that the evidence will establish conclusively—however, if the Commissioner permits that type of evidence—that there was no misrepresentation of any character whatsoever. In the entire record I do not believe there is any evidence whatever that the Government in any way withheld any information that it had, or in any way misrepresented one matter which was untrue in any degree.

That being so, it is a matter of law, and there was no [fol. 13] misrepresentation under the decisions of the Court of Claims and under numerous decisions of the Supreme Court.

That is the basic position which the Government takes with regard to what we consider to be the real issues presented in this case, aside from the issues which arise from questions of damages.

COLLOQUY BETWEEN COMMISSIONER AND COUNSEL

MR. KNOX: Mr Commissioner, referring to counsel's statement, I think perhaps we could clarify this situation. We are not taking a position that there was an intentional misrepresentation. In other words, our position relates to changed conditions, materially different from those in accordance with Article 4, the subsurface, latent conditions.

We believe there are questions of law involved as to the interpreting of what constituted temporary and permanent tunnel protection, and that the contracting officer and the resident engineer, aside from the factual situation, interpreted the contract so that there would be no provision for any type of protection other than temporary protection, which under the terms of the contract had to be borne by the contractor.

So that we have involved questions of law, questions of changed conditions, and I believe that we should be able to go forward with the evidence and make the determination at a later time or at a later period, as to whether or not there was substantial evidence before the Appeals and Review Board. That would go, to a large extent, to the [fol. 14] question of the weight of the evidence. I have in mind the Williams case before the Court of Claims.

COMMISSIONER DAY: This very issue is up before the Court of Claims right now, that is as to whether or not there should be a trial de novo or as to whether the Plaintiff is limited to what is shown by the administrative record. Until the Court comes down with something more definitive than they have heretofore, I am going to hear the evidence that may be offered.

However, I am going to require that counsel for the Plaintiff start off with the administrative determination and its antecedents and the decision thereunder, as a starting point for putting the evidence in.

MR. METZLER: Off the record, please.

(Discussion off the record.)

COMMISSIONER DAY: Back on the record.

MR. KNOX: Mr. Commissioner, it is my understanding, from your statement, that you are requesting that we introduce the record of the Appeals and Review Board and the decision of that Board first, at the outset.

COMMISSIONER DAY: I think you should. That is what you are attacking.

MR. KNOX: Mr. Commissioner, what we had in mind was bringing in a running story of the evidence, and then [fol. 15] bringing in toward the conclusion the entire record of the Appeals and Review Board and the decision, as part of our case.

COMMISSIONER DAY: I will amend my statement to allow you to do so. I won't require it at this point. You may proceed and I will make each ruling as it is indicated.

MR. KNOX: We were only thinking of the sequence of our presentation. In other words, we can introduce the record of the Appeals and Review Board decision. We had intended to do so at a little later stage of the hearing.

COMMISSIONER DAY: Is there any objection to that procedure being followed?

MR. METZLER: Mr. Commissioner, I am not anxious to prolong this trial or to interrupt the presentation by counsel for the Plaintiff, but I am going to object to the introduction of evidence which was not before the Ap-

peals Board, as a basis for showing that the findings of the Board were arbitrary and capricious. I do not see that you can impeach a District Court, for example, or an administrative tribunal, by saying that they failed to act on evidence which was not presented to them. That is the type of issue which we have.

We have no objection to the Commissioner and the Court fully considering and studying the entire record before the Engineers Claims and Appeals Board. We are perfectly willing that the whole matter go in, but if the Plaintiff in this case is seeking to go outside and present documents and so forth, he must show that that record would have been different if they had presented that [fol. 16] evidence and those witnesses, and I am going to object to it, and I am going to object to it right here and now, along with the Commissioner's thought—or what I believe is his thought—that it will go into evidence.

COMMISSIONER DAY: Go ahead.

MR. METZLER: Off the record, please.

(Discussion off the record.)

COMMISSIONER DAY: Back on the record.

MR. KNOX: Mr. Commissioner, we will proceed, if we may.

COMMISSIONER DAY: All right.

MR. KNOX: The first witness will be Thomas R. Sullivan.

COMMISSIONER DAY: Very well.

MR. KNOX: Mr. Commissioner, may I say, before we start with this witness, that we could introduce, if this would help, the record of the Appeals and Review Board decision, but the entire record of exhibits is not available at this hearing because of the fact that a number of those exhibits we do not possess. We tried to obtain them through Mr. Metzler, who does have them, and we have had opportunity to look at them, but we have never been able to obtain them, on the theory that all those exhibits in that Appeals and Review Board hearing were Government property, and we do not have those documents, but Mr. Metzler does.

MR. METZLER: I do not think that is quite the [fol. 17] situation, Mr. Knox. The exhibits which you refer to were returned to you, and I do not have those exhibits. When I say "returned to you," I mean they were returned to the Plaintiff or its prior counsel.

Any documents which I have had, which we know of, and which were before the Review Board, have been available to you or your associate counsel for inspection at any time.

MR. KNOX: That is quite true, but you still possess the exhibits. I am referring now specifically to a list of photographs which you did allow us to examine, but they are in your possession. They were exhibits in that case.

MR. METZLER: I do not want to prolong this, but in so far as I know, the situation is this:

There were thirty-nine or forty photographs, which were apparently before the Engineers Claims and Appeals Board. In so far as I know, however, the photographs which were introduced by your client's prior counsel, they were returned to them, and they are not in the Government's possession. There may be copies, because I gave those photographs to you for the purpose of making copies.

MR. KNOX: That is right.

MR. METZLER: Or for any use you might want to make of them.

MR. KNOX: That is right. We have copies, but they are not the original exhibits. The markings on them are [fol. 18] markings of our own witness. You have the original exhibits, because they were never returned to us.

MR. METZLER: I can say that there were no markings of any kind on them but they were specific exhibits before the Appeals Board. They might have been identified in some way. If that is the only problem, and if you do have copies of those, I would have no objection to introducing those as an exhibit so as to avoid that difficulty.

COMMISSIONER DAY: All right.

MR. METZLER: We do not want to stop at that point.

MR. KNOX: Mr. Commissioner, I would like to request of counsel, or we could at this time have an understanding, that we stipulate that the Appeals and Review Board record, and submit it to the Commissioner in its entirety. You also have some Government pictures or photographs which were introduced, which we do not have.

COMMISSIONER DAY: Let us go off the record for a minute, Mr. Reporter.

(Discussion off the record.)

COMMISSIONER DAY: Back on the record.

MR. KNOX: I might say, Mr. Commissioner, that subsequent to this there was a motion for reconsideration, which was denied January 4th, and this is dated in December. I understand we have got that here.

COMMISSIONER DAY: Very well.

[fol. 19] MR. KNOX: I would like to ask that those documents be marked for identification as Plaintiff's Exhibits Nos. 1, 2 and 3.

COMMISSIONER DAY: Very well.

(Decision of the Appeals and Review Board was marked for identification as Plaintiff's Exhibit No. 1.)

(Record of hearing before the Appeals and Review Board was marked for identification as Plaintiff's Exhibit No. 2.)

(Motion for reconsideration, denied January 4 by Appeals and Review Board was marked for identification as Plaintiff's Exhibit No. 3.)

MR. KNOX: We ask leave to substitute photostatic copies for Plaintiff's Exhibits Nos. 2 and 3.

COMMISSIONER DAY: Very well.

THOMAS R. SULLIVAN, a witness produced on behalf of the Plaintiff, having been first duly sworn by said Commissioner, was examined, and in answer to interrogatories testified as follows:

DIRECT EXAMINATION

BY MR. KNOX:

Q. Mr. Sullivan, will you state your full name and residence?

A. Thomas R. Sullivan, 256 West Central Street, Framingham, Massachusetts.

[fol. 20] Q. Mr. Sullivan, are you associated with Carlo Bianchi and Company, Inc. of Framingham, Massachusetts?

A. Yes.

Q. In what capacity?

A. I am assistant treasurer.

Q. How long a period of time have you been associated with Carlo Bianchi and Company, Inc.?

A. Since 1940.

Q. Will you state whether or not Carlo Bianchi and Company, Inc., is a Massachusetts corporation?

A. It is.

Q. When was it organized?

A. It was incorporated under the laws of the Commonwealth of Massachusetts in 1912.

Q. Mr. Sullivan, are you familiar with the proceeding of Carlo Bianchi and Company, Inc. before the Engineers Appeals and Review Board of the Army Corps of Engineers?

A. Before the Appeals Board, yes.

Q. Do you keep the records of Carlo Bianchi and Company, Inc.?

A. I have over-all responsibility of them and supervision.

Q. I now hand you Plaintiff's Exhibits Nos. 1, 2 and 3, marked for identification, and request that you identify these documents.

[fol. 21] A. Exhibit No. 1 is a transcript of the proceedings of the hearing on the appeal of Carlo Bianchi and Company, Inc., before the Engineers Claims and Appeals Board, under Case No. 14, which took place in Washington, D. C. on June 17, 1948.

Exhibit No. 2 is a letter addressed to Carlo Bianchi and Company, Inc., by the Recorder of that Claims and

Appeals Board on December 14, 1948, appended to which was a certified copy of Decision No. 14 of the Corps of Engineers Claims and Appeals Board, relating to the appeal that I have just mentioned. That was dated December 9, 1948.

Exhibit No. 3 is a letter addressed to Carlo Bianchi and Company, Inc., by the Recorder of the Corps of Engineers Claims and Appeals Board on January 14, 1949, appended to which is a supplementary opinion rendered by the Board, under date of January 3, 1949.

MR. KNOX: Mr. Commissioner, I now offer into evidence Plaintiff's Exhibits Nos. 1, 2 and 3.

MR. METZLER: No objection, subject to comparison and verification.

COMMISSIONER DAY: Admitted.

(The documents heretofore marked for identification as Plaintiff's Exhibits Nos. 1, 2 and 3, were made a part of this record)

MR. KNOX: We request with respect to Plaintiff's Exhibits Nos. 2 and 3 that we may substitute photostatic copies.

[fol. 22] MR. METZLER: No objection.

COMMISSIONER DAY: Very well.

MR. KNOX: Will you identify this document as Plaintiff's Exhibit No. 4-A and B, Mr. Reporter?

(Contractor's copy of original contract agreement with the Department of the Army, U. S. Engineers Office, Contract W-30-180-eng-397, dated July 3, 1946 was marked for identification as Plaintiff's Exhibit No. 4-A.)

(Bound set of the contract drawings applicable to said contract, enclosing copy of Addendum No. 1 was marked for identification as Plaintiff's Exhibit No. 4-B.)

BY MR. KNOX:

Q. Mr. Sullivan, I now hand you Plaintiff's Exhibit No. 4-A marked for identification and Exhibit No. 4-B like-

wise marked for identification, and request that you identify those documents.

A. Exhibit No. 4-A consists of the Contractor's copy of the original contract agreement with the Department of the Army, U. S. Engineers Office, Contract W-30-180-eng-397, that contract being dated July 3, 1946.

Enclosed in the same folder is a set of the contract specifications, together with Addenda No. 1 and 2 thereof.

Exhibit No. 4-B is composed of a bound set of the [fol. 23] contract drawings, applicable to that contract. Enclosed in it, as well, is a copy of Addendum No. 1, together with an additional set of eight drawings, revised, which accompanied Addendum No. 1.

MR. KNOX: Mr. Commissioner, at this time I would like to offer Plaintiff's Exhibits Nos. 4-A and 4-B.

MR. METZLER: Mr. Commissioner, we have no objection to the introduction of Plaintiff's Exhibits Nos. 4-A and 4-B, subject to comparison and verification. However, attention is called to the fact that the contract counsel offered is incomplete, and that there were numerous changes subsequent to the time that it was entered into.

COMMISSIONER DAY: If they do not intend to offer them, you can. You can round it out.

MR. METZLER: I am just calling attention right now that the document is objectionable, in so far as it is an incomplete copy of the contract which was entered into between the parties. I think the burden is on the Plaintiff and not on the Government to introduce the complete contract.

COMMISSIONER DAY: Off the record, Mr. Reporter, please.

(Discussion off the record.)

COMMISSIONER DAY: Back on the record. Is your objection satisfied now, Mr. Metzler?

MR. METZLER: If these documents as offered include the complete contract and the modifications, I think that it would be complete. However, I have not had time [fol. 24] to examine these documents as yet.

COMMISSIONER DAY: They will be subject to verification.

MR. METZLER: Very well.

MR. KNOX: Always.

(Plaintiff's Exhibits Nos. 4-A and 4-B were remarked as Plaintiff's Exhibits Nos. 4-A[1] and 4-A[2].)

(Modifications and changes of contract was marked Plaintiff's Exhibit No. 4-A[3].)

MR. METZLER: That is satisfactory.

MR. KNOX: I want to offer these documents subject to substitution of the change orders because these are the originals, and we would like to have them back, and they can always be verified.

COMMISSIONER DAY: Very well. They will be received.

MR. KNOX: Off the record.

(Discussion off the record.)

COMMISSIONER DAY: Back on the record.

BY MR. KNOX:

Q. Mr. Sullivan, in relation to Plaintiff's Exhibit No. 4 for identification, I now hand you Plaintiff's Exhibit No. 4-A[1], 4-A[2] and 4-A[3] marked for identification and will you state what these consist of?

A. First, No. 2 is a folder in which are contained a [fol. 25] series of change order modifications officially made by the Corps of Engineers to the contractor. There are sixteen of them. And these are the contractor's signed copies. No. 4-A[3] consists of a typewritten facsimile of the original Contract W-30-180-eng-397, dated July 3, 1956 with the War Department, U. S. Engineers Office.

MR. KNOX: Mr. Commissioner, I now offer into evidence as Plaintiff's Exhibits 4-A[1], 4-A[2], and 4-A[3] the documents described by the witness, with leave to substitute for Plaintiff's Exhibit 4-A[2] true and authentic copies of the change of orders and modifications.

MR. METZLER: I have no objection to substituting a photostatic copy if that is what you mean.

MR. KNOX: Photostatic copies will be furnished.

THE WITNESS: They are not photostatic copies. One is. Most of them are ditto copies representing an extra copy furnished to us by the Corps of Engineers. Two or three of them are typed completely, as you will see.

MR. KNOX: They are all subject to verification.

MR. METZLER: I have no objection subject to comparison and verification and provided that legible copies are furnished.

COMMISSIONER DAY: There is no point in giving us anything that we can't read, because it won't be read, anyway.

MR. METZLER: We might want to read it, too.

MR. KNOX: With the exception of the first two sheets.

[fol. 26] COMMISSIONER DAY: They are admitted.

(The documents heretofore marked for identification Plaintiff's Exhibits Nos. 4-A[1], 4-A[2] and 4-A[3] were made a part of this record.)

MR. KNOX: Off the record.

(Discussion off the record.)

COMMISSIONER DAY: Go ahead, Mr. Knox.

MR. KNOX: Mark this Plaintiff's Exhibit No. 5, please.

(Letter addressed by Col. A. C. Welling, District Engineer of the Baltimore District of Corps of Engineers, dated July 20, 1949 to Carlo Bianchi & Co., Inc. was marked Plaintiff's Exhibit No. 5 for identification.)

BY MR. KNOX:

Q. Mr. Sullivan, I now hand you Plaintiff's Exhibit No. 5 marked for identification. Will you identify it?

A. This is a letter addressed by Colonel A. C. Welling, District Engineer of the Baltimore District of the Corps of Engineers, on July 20, 1949 to Carlo Bianchi and Company, Inc., informing the contractor that all work

and services in connection with Contract W-30-180-eng-397 was satisfactorily completed in accordance with the terms of the contract on June 30, 1949 and are hereby accepted.

COMMISSIONER DAY: You may be seated while you are testifying, if you like.

[fol. 27] THE WITNESS: Thank you.

MR. KNOW: I now offer Plaintiff's Exhibit No. 5 for identification in evidence.

MR. METZLER: No objection.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 5 was made a part of this record.)

MR. KNOX: Mark this document Plaintiff's Exhibit No. 6 for identification, please.

(Climaticalogical data from U.S. Weather Bureau, Albany, New York, for December 1946 through May 1947 was marked for identification Plaintiff's Exhibit No. 6.)

BY MR. KNOX:

Q. Mr. Sullivan, I now hand you Plaintiff's Exhibit No. 6 marked for identification, consisting of certain printed documents, and ask you to identify this exhibit.

A. This exhibit consists of the climaticalogical data from the U. S. Weather Bureau, Albany, New York, covering the months of December 1946 through May 1947, together with a certification by Harold J. Smith, Acting Meteorologist in charge at Albany, that the six publications are official publications of the United States Weather Bureau.

Q. Mr. Sullivan, do these weather reports to which you have referred show the precipitation and temperatures at [fol. 28] the area at the Almond Tunnel?

A. Yes, they cover the so-called New York Section included, in which is an official U. S. Weather Station at Alfred University, and the data covering daily precipitation is shown in detail.

Q. For what period?

A. For all those months that I named, from December 1946 through May 1947.

MR. KNOX: Mr. Commissioner, I now offer Plaintiff's Exhibit No. 6 for identification into evidence.

MR. METZLER: I have no objection to these reports being received, subject to some relevancy being later established.

COMMISSIONER DAY: They may be received.

(The document heretofore marked for identification Plaintiff's Exhibit No. 6 was made a part of this record.)

COMMISSIONER DAY: Suppose we take about a five-minute recess at this point and let's limit it to five minutes.

(Short recess.)

COMMISSIONER DAY: Proceed.

BY MR. KNOX:

Q. Mr. Sullivan, I now hand you a document marked for identification as Plaintiff's Exhibit No. 7. Will you identify it?

A. This is the contractor's file copy of a letter dated [fol. 29] October 14, 1946 addressed to Mr. D. E. Mather, Resident Engineer.

(Copy of letter dated October 14, 1946 to Mr. D. E. Mather, Resident Engineer, was marked for identification Plaintiff's Exhibit No. 7.)

(Letter to Carlo Bianchi & Co., Inc., from Resident Engineer on Oct. 17, 1946 was marked for identification Plaintiff's Exhibit No. 8.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 8 for identification. Will you briefly describe it so we can identify it?

A. No. 8 is a letter addressed to Carlo Bianchi & Company, Inc., by the Resident Engineer on October 17, 1946. This is an original letter.

Q. I now hand you Plaintiff's Exhibit No. 9, marked for identification.

(Contractor's file copy of letter to District Engineer at Baltimore, Maryland, on December 12, 1946, was marked for identification Plaintiff's Exhibit No. 9.)

BY MR. KNOX:

Q. Will you please tell us what that is?

A. No. 9 is the contractor's file copy of a letter addressed to the District Engineer at Baltimore, Maryland on December 12, 1946.

[fol. 30] (Letter by Col. J. S. Sebold, District Engineer, to Carlo Bianchi & Co., Inc., dated December 18, 1946, was marked for identification Plaintiff's Exhibit No. 10.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 10 marked for identification, and ask you what that is?

A. No. 10 is a letter written by Colonel J. S. Sebold, District Engineer, to Carlo Bianchi & Company, Inc., on December 18, 1946. This is an original letter.

(Contractor's file copy of letter to Resident Engineer on December 18, 1946 was marked for identification Plaintiff's Exhibit No. 11.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 11 marked for identification.

A. No. 11 is the contractor's file copy of a letter addressed to Resident Engineer on December 18, 1946.

(Original letter from Resident Engineer to Carlo Bianchi & Co., Inc., on December 20, 1946 was marked for identification as Plaintiff's Exhibit No. 12.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 12 marked for identification.

A. No. 12 is an original letter written by the Resident [fol. 31] Engineer to Carlo Bianchi & Company, Inc., on December 20, 1946.

(Original letter written by the District Engineer to Carlo Bianchi & Co., Inc., on December 20, 1946 was marked for identification Plaintiff's Exhibit No. 13.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 13 marked for identification.

A. This is an original letter written by the District Engineer to Carlo Bianchi & Company, Inc., on December 20, 1946.

(Copy of letter to District Engineer on December 27, 1946 was marked Plaintiff's Exhibit No. 14 for identification.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 14 marked for identification.

A. No. 14 is the contractor's file copy of a letter written to the District Engineer on December 27, 1946.

(Original letter from District Engineer to Carlo Bianchi & Co., Inc. on January 3, 1947 was marked Plaintiff's Exhibit No. 15 for identification.)

BY MR. KNOX:

Q. Now I hand you Plaintiff's Exhibit No. 15 marked for identification.

[fol. 32] A. No. 15 is an original letter written by the District Engineer to Carlo Bianchi & Company, Inc. on January 3, 1947.

(Contractor's file copy of letter to Resident Engineer on January 14, 1947 was marked for identification Plaintiff's Exhibit No. 16.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 16 marked for identification.

A. No. 16 is the contractor's file copy of a letter addressed to the Resident Engineer on January 14, 1947.

(Contractor's file copy of letter to Resident Engineer on January 14, 1947 was marked for identification Plaintiff's Exhibit No. 17.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 17 marked for identification.

A. No. 17 is the contractor's file copy of a letter addressed to the Resident Engineer on January 14, 1947.

(Original letter from Resident Engineer on January 20, 1947 to Carlo Bianchi & Co., Inc., was marked for identification Plaintiff's Exhibit No. 18.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 18 for identification, and ask you what that is.

A. No. 18 is an original letter written by the Resident [fol. 33] Engineer on January 20, 1947 to Carlo Bianchi & Company, Inc.

Contractor's file copy of letter to District Engineer on January 24, 1947 was marked for identification Plaintiff's Exhibit No. 18-A.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 18-A marked for identification.

A. Plaintiff's Exhibit No. 18-A is the contractor's file copy of a letter addressed to the District Engineer on January 24, 1947.

(Original letter from District Engineer to Carlo Bianchi & Co., Inc., on February 3, 1947 was marked for identification Plaintiff's Exhibit No. 19.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 19 marked for identification.

A. No. 19 is an original letter written by the District Engineer to Carlo Bianchi & Company, Inc., on February 3, 1947.

(Copy of letter dated April 10, 1947 to Resident Engineer was marked for identification Plaintiff's Exhibit No. 20.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 20 marked for identification.

A. No. 20 is a contractor's file copy of a letter dated [fol. 34] April 10, 1947 addressed to the Resident Engineer.

(Original letter from Assistant Resident Engineer to Carlo Bianchi & Co., Inc., on April 14, 1947 was marked for identification Plaintiff's Exhibit No. 21.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 21 marked for identification.

A. No. 21 is an original letter written by Dale Lasey, Assistant Resident Engineer, on April 14, 1947, to Carlo Bianchi & Company, Inc.

(Photostatic copy of letter from Carlo Bianchi & Co., Inc. to Resident Engineer on April 23, 1947 was marked for identification Plaintiff's Exhibit No. 22.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 22 marked for identification.

A. No. 22 is a photostatic copy of a letter addressed by Carlo Bianchi & Company, Inc. to the Resident Engineer on April 23, 1947.

(Photostatic copy of letter from Carlo Bianchi & Co., Inc. to District Engineer, April 23, 1947 was marked for identification Plaintiff's Exhibit No. 23.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 23 marked [fol. 35] for identification.

A. No. 23 is a photostatic copy of a letter addressed by Carlo Bianchi & Company, Inc. to the District Engineer on April 23, 1947.

(Original letter from District Engineer to Carlo Bianchi & Co., Inc., May 5, 1947 was marked for identification Plaintiff's Exhibit No. 24.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 24 marked for identification.

A. No. 24 is an original letter from the District Engineer to Carlo Bianchi & Company, Inc., dated May 5, 1947.

(Contractor's file copy of a letter to District Engineer on May 26, 1947 was marked for identification Plaintiff's Exhibit No. 25.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 25 marked for identification.

A. No. 25 is the contractor's file copy of a letter written to the District Engineer on May 26, 1947.

(Contractor's file copy of letter to Secretary of War, Washington, D. C. from Carlo Bianchi & Co., Inc., on May 29, 1947, was marked for identification Plaintiff's Exhibit No. 26.)

[fol. 36] BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 26 marked for identification.

A. No. 26 is the contractor's file copy of a letter addressed to the Secretary of War, Washington, D. C., by the Carlo Bianchi & Company, Inc., on May 29, 1947.

(Contractor's file copy of letter addressed to District Engineer on May 29, 1947 was marked for identification Plaintiff's Exhibit No. 26-A.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 26-A marked for identification.

A. 26-A is the contractor's file copy of a letter addressed to the District Engineer on May 29, 1947.

(Original letter from B. C. Samples, Chief Construction Division, Corps of Engineers, to Carlo Bianchi & Co., Inc., on June 2, 1947 was marked for identification Plaintiff's Exhibit No. 27.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 27 for identification.

A. No. 27 is an original letter addressed by B. C. Samples, Chief Construction Division, Corps of Engineers, to Carlo Bianchi & Company, Inc., on June 2, 1947.

[fol. 37] (Original letter to Carlo Bianchi & Co., Inc., from W. H. Fox, Recorder of the Corps of Engineers Claims and Appeals Board, June 5, 1947, was marked for identification Plaintiff's Exhibit No. 28.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 28 marked for identification.

A. No. 28 is an original communication addressed to Carlo Bianchi & Company, Inc., by W. H. Fox, Recorder of the Corps of Engineers, Claims and Appeals Board, Washington, D. C., dated June 5, 1947.

(Original letter from District Engineer to Carlo Bianchi & Co., Inc., June 13, 1947 was marked for identification Plaintiff's Exhibit No. 29.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 29 marked for identification.

A. No. 29 is an original letter written by the District Engineer on June 13, 1947 to Carlo Bianchi & Company, Inc.

(Contractor's file copy of a letter addressed to the District Engineer on June 23, 1947 was marked for identification Plaintiff's Exhibit No. 30.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 30 marked for identification.

[fol. 38] A. No. 30 is the contractor's file copy of a letter addressed to the District Engineer on June 23, 1947.

(Contractor's file copy of a letter to Resident Engineer from Carlo Bianchi & Co., Inc., June 23, 1947 was marked for identification Plaintiff's Exhibit No. 31.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 31 marked for identification.

A. No. 31 is the contractor's file copy of a letter addressed to the Resident Engineer by Carlo Bianchi & Company, Inc., on June 23, 1947.

(Contractor's file copy of a letter to District Engineer, July 25, 1947 was marked for identification as Plaintiff's Exhibit No. 32.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 32 marked for identification.

A. No. 32 is the contractor's file copy of a letter addressed to the District Engineer on July 25, 1947.

(Contractor's file copy of a letter addressed to the Resident Engineer on July 30, 1947, was marked for identification Plaintiff's Exhibit No. 33.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 33 for [fol. 39] identification.

A. No. 33 is the contractor's file copy of a letter addressed to the Resident Engineer on July 30, 1947.

(Contractor's file copy of a letter addressed to the District Engineer on August 1, 1947 was marked for identification as Plaintiff's Exhibit No. 34.)

BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 34 marked for identification.

A. No. 34 is the contractor's file copy of a letter addressed to the District Engineer on August 1, 1947.

(Original letter to Carlo Bianchi & Co., Inc., from J. P. Campbell, Lt. Col., Corps of Engineers, Acting District Engineer, August 11, 1947, was marked for identification as Plaintiff's Exhibit No. 35.)

BY MR. KNOX:

Q. I hand you Plaintiff's Exhibit No. 35 marked for identification.

A. Plaintiff's Exhibit No. 35 is an original letter addressed to Carlo Bianchi & Company, Inc., on August 11, 1947 by J. P. Campbell, Lt. Col., Corps of Engineers, Acting District Engineer.

(Contractor's file copy of a letter dated August 15, 1947 to District Engineer was marked for identification Plaintiff's Exhibit No. 36.)

[fol. 40] BY MR. KNOX:

Q. I now hand you Plaintiff's Exhibit No. 36 marked for identification.

A. Plaintiff's Exhibit No. 36 is the contractor's file copy of a letter dated August 15, 1947 addressed to the District Engineer.

MR. KNOX: Mr. Commissioner, at this time I wish to offer into evidence Plaintiff's Exhibit No. 7 through Plaintiff's Exhibit No. 36, inclusive.

MR. METZLER: I would have to have some time to examine the exhibits, Mr. Commissioner, before taking any position with respect to them.

COMMISSIONER DAY: Well, take the time. Wouldn't you prefer to do that?

MR. KNOX: It is perfectly all right. I will sit down for a few minutes.

COMMISSIONER DAY: Mr. Metzler, I don't mind your examining them, but I didn't want to sit here while you are making a lot of notes.

MR. METZLER: I am merely making a check, Mr. Commissioner, to ascertain whether or not I have a valid objection, and in order to do that, that involves the checking of several records. For example, I am trying not to make objections which will just clutter up the record.

With respect to Plaintiff's Exhibit No. 7, for example, [fol. 41] the first document, it does not appear that, at least from the information I have presently examined, this was before the Engineers Appeal Board. If that is the situation then I would object to it as a document which was not previously submitted to the Engineers Appeals Board.

COMMISSIONER DAY: You can make objection with respect to any of them that were not before the Board.

MR. METZLER: I would be glad to do that and that is what I was trying to do, Your Honor, but in order to do that it takes some time to examine these some twenty-nine documents.

COMMISSIONER DAY: These twenty-nine documents obviously are all letters that were either sent to one of your people or received by one of your people, and you can determine that by looking at the documents.

MR. METZLER: That doesn't make them admissible in evidence, Mr. Commissioner, the mere fact that they were an exchange of correspondence.

COMMISSIONER DAY: The only observation I have is I am not going to sit here while you make a lot of extensive notes about each one of the papers before you state your position with respect to each one of them. You can make your records as you go along.

MR. METZLER: I haven't even been given an opportunity to see these twenty-nine documents and I have had but two minutes to examine them.

[fol. 42] COMMISSIONER DAY: We are not calling upon you to state your objection with respect to all twenty-nine of them in an instant, and I am not going to sit here while you make extensive notes about each document so you can determine what objection, if any, you may have.

MR. METZLER: Well, all that I am trying to do is not to make objections here unnecessarily. If I must make a blanket objection, then I must object to any of these documents unless it were established that they were before the Appeals Board. Otherwise, I do not believe they are competent or relevant to the case and, secondly, I must make an objection to any of the documents unless it is established that they have something to do with this case. The mere fact that they are documents exchanged between the parties does not make them admissible in evidence. I think that many of these documents were before the Appeals Board and I think perhaps many of the documents are relevant, but I just haven't had time to make that check. That is all. I am trying to do the best I can.

MR. KNOX: Mr. Commissioner, if I may say that of these documents, these exhibits which we have offered, sixteen of those letters were called to the attention of Mr. Metzler pursuant to Rule 28 (B) (1). Now, those sixteen letters are letters from the contractor to the Resident Engineer, the contracting officer and various branches of the Army Corps of Engineers. Those letters, [fol. 43] the originals, are in the possession of Mr. Metzler and he has had an opportunity to examine those, and as I gathered from a conversation, you indicated that you had no objection to those sixteen copies where the originals reposed in your possession.

The balance, as I understood it, of the exhibits here are the original letters from the War Department.

Now, I have introduced, for various reasons, in order to make your record complete, the appeal notice and the Engineers' Appeals and Review Board, the acknowledgment of it, and in addition the correspondence with the Engineers' Corps in this matter. I think all that is relevant and material.

COMMISSIONER DAY: The only observation I had was with respect to the fact I am not going to sit here while extensive notes are being made about each document. Instead of that we will just take them one at a time and let you look at them and give you reasonable time to look at each one.

MR. METZLER: I made two notes of two lines. That is the extent of my notes, Mr. Commissioner, on these documents. I didn't have the opportunity because they were introduced so fast, to even correctly identify them. I am sorry.

COMMISSIONER DAY: I have a list of each one of them I made as they were being identified by the witness.

What is your position with respect to Plaintiff's Exhibit No. 7? We will take them one at a time.

MR. METZLER: Mr. Commissioner, with respect to [fol. 44] No. 7, it is not established that this document was before the Appeals Board, at least at the present time.

COMMISSIONER DAY: Do you have any further objection?

MR. METZLER: I don't think that this witness has been qualified to testify with respect to the contents of the letter. We will admit the receipt of them.

COMMISSIONER DAY: I am here to hear whatever objection you have. I don't want to have a recitation about your position about it. If you have an objection, state it.

MR. METZLER: Well, I think I am stating my objection.

COMMISSIONER DAY: Do you have any further objection? I want to know if you are through.

MR. METZLER: I have stated my position as to No. 7.

COMMISSIONER DAY: Then proceed.

MR. METZLER: It is clear, Mr. Commissioner, that I have objected on the ground the witness has not been qualified to testify to the contents of this letter of October 14, 1947, Plaintiff's Exhibit No. 7.

COMMISSIONER DAY: I suppose the Reporter got your objection.

MR. METZLER: With respect to Plaintiff's Exhibit No. 8 it is not established that this was presented to the Engineers Claims and Appeals Board. There is no objection to the document otherwise except that I would like to ask Mr. Sullivan whether or not this appendage [fol. 45] was affixed to the original document when it was received or whether that was subsequently added?

THE WITNESS: The appendage is a transcript of Article 4 "Changed Conditions" of the contract specifications.

COMMISSIONER DAY: Was it on there when you got the letter?

THE WITNESS: It wasn't on there when we got it. I had it put on there in order to properly study the letter itself.

MR. METZLER: It will be so considered, then, that this is not a part of the comunication?

THE WITNESS: You can tear it off if you want to.

COMMISSIONER DAY: It may be received.

(The document heretofore marked for identification Plaintiff's Exhibit No. 7 was made a part of this record.)

COMMISSIONER DAY: With respect to the objection that it does not appear that it was before the Board, I am going to admit any of these letters over that objection, having in mind that you are going to agree to or at least you have told me that you are going to agree with respect to precisely what letters were before the Board, so that any that were not, obviously were not.

MR. METZLER: The claimant said they were going to establish that. In so far as I can I will endeavor to agree, but I am not going to take the position at this time that I [fol. 46] can agree to something without proof. In so far as the proof is known to me I will admit it, but not beyond that.

COMMISSIONER DAY: Well, don't you know what was before the Board?

MR. METZLER: Well, Mr. Commissioner, this was approximately eight years ago.

COMMISSIONER DAY: Wasn't there a record made about what exhibits were before the Board?

MR. METZLER: There was a transcript of some seventy-nine pages where reference was made to various exhibits which were before the Board.

COMMISSIONER DAY: There is no list of exhibits?

MR. METZLER: There was no list of exhibits, no.

MR. KNOX: Mr. Commissioner, over a year ago I spent a great deal of time on the transcript of record,

prepared a very lengthy letter to Mr. Metzler identifying all the Plaintiff's exhibits in the transcript, including photographs. I submitted it to Mr. Metzler and he referred it to Mr. Thompson in the Department of Justice, and they had it for about two months and I was trying to get them to stipulate what the record was because it is not too clear in the transcript, because the way they identified some of the exhibits, some of the photographs were just handed to the administrative board, and that is true of the Government photographs and exhibits as well as Plaintiff's, and I tried to stipulate the complete [fol. 47] record but I was never successful in getting an agreement on it. You may recall that, Mr. Metzler.

MR. METZLER: We made some efforts to consider this and in so far as it was possible we did, but even at the present time you apparently aren't able to state whether or not this letter of October 14, 1946 or October 17, 1946 was before the Board. If it was then I will withdraw my objection, that is all.

COMMISSIONER DAY: If the Board did not make some kind of record, you can understand, sufficiently to determine that question quickly, well, I would overrule your objection pretty rapidly on that.

MR. METZLER: The record before the Board as presented by the Plaintiff, which was represented by another counsel at that time, I think is reasonably clear. However, in the records that I have of the numerous exhibits it does not appear to me at this time that these specific documents were before the Board, and I am quite confident that many of the others which have been offered today were not before the Board, either.

COMMISSIONER DAY: 8 is admitted. Let us move to 9.

(The document heretofore marked for identification Plaintiff's Exhibit No. 8 was made a part of this record.)

MR. METZLER: The reason I say that, Mr. Com- [fol. 48] missioner is because the exhibits that were before the Board were numbered A to N. And then several exhibits were numbered AA to EE, and there are far

more than that offered here today by counsel. But the record is, I think, clear.

The same objection is made with respect to Plaintiff's Exhibit No. 9.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 9 was made a part of this record.)

MR. METZLER: The same objection with respect to Plaintiff's Exhibit No. 10.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 10 was made a part of this record.)

MR. METZLER: Plaintiff's Exhibit No. 11 appears to have been before the Board, but objection is made to relevancy and materiality, otherwise, unless that is established.

COMMISSIONER DAY: It may be received.

(The document heretofore marked for identification Plaintiff's Exhibit No. 11 was made a part of this record.)

MR. METZLER: If you will notice, Mr. Commissioner, this is signed apparently by someone other than the witness by whom it was identified.

[fol. 49] COMMISSIONER DAY: Yes.

MR. METZLER: I mean I don't think this witness is in a position to testify with respect to the contents of the document in so far as it is offered to show that it was sent. I mean I have no objection to that.

COMMISSIONER DAY: That is all it could possibly be at this point.

MR. METZLER: If that's the understanding, it may speed up my objection.

COMMISSIONER DAY: The witness has not testified with respect to the contents of the letter, Mr. Metzler.

MR. METZLER: All right.

Plaintiff's Exhibit No. 12, no objection.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 12 was made a part of this record.)

MR. METZLER: Mr. Sullivan, may I ask is it not also true that the appendages were not a part of the original letter, Plaintiff's Exhibit No. 13?

THE WITNESS: The same situation prevails here. There were various references in here, as you will note, to specifications, and these simply facilitate the reading.

MR. METZLER: They were not part of the original?

THE WITNESS: They were not part of the original.

[fol. 50] MR. KNOX: Mr. Commissioner, let's remove that and see if we can get along. We had one other the same way and we will check that.

MR. METZLER: Let's let it as it is. Don't destroy the record.

COMMISSIONER DAY: He is withdrawing the part you had a question about.

MR. KNOX: Here is the original exhibit as we had it marked for identification. This is not part of it.

MR. METZLER: I have a further objection that it does not appear that Plaintiff's Exhibit No. 13 was before the Appeals Board, either, Mr. Commissioner.

COMMISSIONER DAY: It may be received.

(The document heretofore marked for identification Plaintiff's Exhibit No. 13 was made a part of this record.)

MR. METZLER: Same objection with respect to Plaintiff's Exhibit No. 14.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 14 was made a part of this record.)

MR. METZLER: Same objection with respect to Plaintiff's Exhibit No. 15.

COMMISSIONER DAY: Admitted.

[fol. 51] (The document heretofore marked for identification Plaintiff's Exhibit No. 15 was made a part of this record.)

MR. METZLER: Same objection with respect to No. 16.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 16 was made a part of this record.)

MR. METZLER: Same objection with respect to No. 17.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 17 was made a part of this record.)

MR. METZLER: No objection to No. 18, with the understanding that the various additions made to the typed portion did not appear on the original.

COMMISSIONER DAY: Admitted with that understanding.

(The document heretofore marked for identification Plaintiff's Exhibit No. 18 was made a part of this record.)

MR. METZLER: The same objection with respect to Plaintiff's Exhibit No. 18-A, namely, that this does not appear to have been before the Appeals Board, Mr. Commissioner.

COMMISSIONER DAY: It may be received.

(The document heretofore marked for identification Plaintiff's Exhibit No. 18-A was made a part of this record.)

[fol. 52] MR. METZLER: Same objection with respect to Plaintiff's Exhibit No. 19.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 19 was made a part of this record.)

MR. METZLER: We admit the receipt of Plaintiff's Exhibit No. 20 in that it was before the Appeals Board.
COMMISSIONER DAY: It may be received.

(The document heretofore marked for identification Plaintiff's Exhibit No. 20 was made a part of this record.)

MR. METZLER: No objection to No. 21.
COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 21 was made a part of this record.)

MR. METZLER: It is understood that in all cases, Mr. Commissioner, where there is a copy that we will have the opportunity to make a comparison or verification of the original.
COMMISSIONER DAY: Oh, certainly.
MR. KNOX: Where the original is in your possession.
MR. METZLER: That's right, yes.
We admit the receipt of No. 22 and that it was before the Appeals Board.
[fol. 53] COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 22 was made a part of this record.)

MR. METZLER: The same is also true with respect to No. 23.
COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 23 was made a part of this record.)

MR. METZLER: Also No. 24.
COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 24 was made a part of this record.)

MR. METZLER: We admit the receipt of No. 25 and that it was before the Appeals Board is also admitted.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 25 was made a part of this record.)

MR. METZLER: No objection to No. 26.
COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 26 was made a part of this record.)

MR. METZLER: No objection to No. 26-A.
[fol. 54] COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 26-A and was made a part of this record.)

MR. METZLER: Objection to Plaintiff's Exhibit No. 27 in so far as it does not appear that it was before the Appeals Board and, of course, no relevancy or no materiality has been established.
COMMISSIONER DAY: Let me see it. (Document handed to the Commissioner)
It may be received.

(The document heretofore marked for identification Plaintiff's Exhibit No. 27 was made a part of this record.)

MR. METZLER: No objection to No. 28.
COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 28 was made a part of this record.)

MR. METZLER: No objection to No. 29.
COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 29 was made a part of this record.)

MR. METZLER: No objection to Plaintiff's Exhibit No. 30 in so far as the receipt or the fact that it was before the Appeals Board.

[fol. 55] COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 30 was made a part of this record.)

MR. METZLER: No. 31 is objected to on the ground that it does not appear that this was before the Appeals Board and on other grounds of relevancy previously stated.

COMMISSIONER DAY: Let me see it. Whenever you object to relevancy I will have to see it.

MR. METZLER: I understood, Mr. Commissioner, that this ruling was based solely on the question of whether these documents were received, it being understood in all cases that the witness on the stand who identified these documents was not established to be competent to testify with respect to the contents.

COMMISSIONER DAY: That is right. If you are going to make any other objection then I have to take a look at it.

MR. METZLER: I merely put that in. Mr. Commissioner, it has a reservation so our position would be as clear as I could make it.

COMMISSIONER DAY: Whenever you make it I have to see the exhibit so I can rule on it.

It may be received.

(The document heretofore marked for identification Plaintiff's Exhibit No. 31 was made a part of this record.)

[fol. 56] MR. METZLER: We admit the receipt of No. 32 and that it was before the Appeals Board.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 32 was made a part of this record.)

MR. METZLER: No. 33 is objected to as not being before the Appeals Board.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 33 was made a part of this record.)

MR. METZLER: The same objection with respect to No. 34.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 34 was made a part of this record.)

MR. METZLER: No objection to No. 35.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 35 was made a part of this record.)

MR. METZLER: We admit the receipt of No. 36 and that it was before the Appeals Board.

COMMISSIONER DAY: It may be received.

(The document heretofore marked for identification Plaintiff's Exhibit No. 36 was made a part of this record.)

[fol. 57] COMMISSIONER DAY: We will recess at this time until 2:00 o'clock.

(Whereupon, at 12:40 o'clock p.m., the hearing was adjourned until 2:00 o'clock p.m.)

AFTERNOON SESSION. (2:00 o'clock p.m.)

COMMISSIONER DAY: You may proceed, gentlemen.

THOMAS R. SULLIVAN, resumed the witness-stand, having been previously sworn by said Commissioner, and testified further as follows:

DIRECT EXAMINATION (Cont'd)

MR. KNOX: I would like to have this document marked for identification as Exhibit No. 37, Mr. Reporter.

(Order issued by Department of Labor of the State of New York, Bureau of Mines, Tunnels, Quarries and Explosives was marked for identification as Plaintiff's Exhibit No. 37.)

BY MR. KNOX:

Q. Mr. Sullivan, I hand you Plaintiff's Exhibit No. 37 marked for identification. Will you state what it consists of?

A. This Exhibit No. 37 is an order issued by the Department of Labor of the State of New York, Bureau of Mines, Tunnels, Quarries and Explosives, on their Form No. 407 which directs Carlo Bianchi & Company, Inc.—

MR. METZLER: I object to the witness testifying to [fol. 58] any document not in evidence.

COMMISSIONER DAY: Sustained.

BY MR. KNOX:

Q. Mr. Sullivan, was that order received in your office?

A. That is right.

MR. KNOX: I now offer as Plaintiff's Exhibit No. 37 the document referred to by the witness.

MR. METZLER: No objection to the receipt of the document in evidence, showing it was one received by the plaintiff. We do object to it, in so far as the contents are concerned, unless the person who wrote the document is available for cross-examination.

MR. KNOX: Mr. Commissioner, this is shown to be an official order of the Department of Labor of the State of New York, and I think it speaks for itself.

COMMISSIONER DAY: I think that Mr. Metzler's objection is good as to the contents. He is willing to concede that you received this, but when you want to prove—

MR. KNOX: We will introduce it on that basis.

COMMISSIONER DAY: It may be received on that basis.

(The document heretofore marked for identification Plaintiff's Exhibit No. 37 was made a part of this record.)

MR. KNOX: That it is not proof of the contents?

COMMISSIONER DAY: Yes, sir.

[fol. 59] MR. KNOX: Will you mark this document for identification, please, Mr. Reporter?

(Letter dated August 7, 1956 from J. Harrington, Vice President of National Shawmut Bank of Boston in re Almond Dam Contract was marked for identification as Plaintiff's Exhibit No. 38.)

BY MR. KNOX:

Q. Mr. Sullivan, I now hand you Plaintiff's Exhibit No. 38 marked for identification. Will you describe this exhibit, please?

A. This Exhibit No. 38 is an original letter addressed on August 7, 1956 by J. Harrington, Vice President of the National Shawmut Bank of Boston to T. R. Sullivan, Assistant Treasurer of Carlo Bianchi & Company, Inc., with reference to Contract W-30-180-eng-397, which is the Almond Dam Contract.

Do you want the contents of the letter?

Q. That letter was addressed to you?

A. That is right.

Q. Was there a condition described therein?

MR. METZLER: I object to that.

COMMISSIONER DAY: Sustained.

MR. KNOX: Mr. Commissioner, we submitted this under Rule 28 to Mr. Metzler, to show the genuineness thereof, and I would like to have you look at it.

COMMISSIONER DAY: I may have seen it before. (Examining document) Yes, I have seen it.

[fol. 60] MR. KNOX: Mr. Commissioner, as I understand it now, the objection as to the contents of the letter has been sustained. Is that right?

COMMISSIONER DAY: Merely with respect to this witness' testimony concerning the contents.

MR. KNOX: I see. We will offer the exhibit with that understanding.

MR. METZLER: I accept the Commissioner's ruling.

COMMISSIONER DAY: The offer of the document has been made.

MR. METZLER: I have no objection to it, with the reservation stated, namely, that the witness is competent to testify that he received it but as to the contents, we object to that, unless the witness is present to be cross-examined on the contents of it.

COMMISSIONER DAY: I will have to sustain that objection. He is willing to admit the letter, that you got the letter, but that is all.

MR. KNOX: I am marking it with that understanding of the objection.

COMMISSIONER DAY: It may be received.

(The document heretofore marked for identification Plaintiff's Exhibit No. 38 was made a part of this record.)

COMMISSIONER DAY: You can get testimony from this witness with respect as to whether or not the debt to the bank had been extinguished.

[fol. 61] MR. KNOX: I am going to ask him that question now.

BY MR. KNOX:

Q. Mr. Sullivan, at one time did Carlo Bianchi & Company execute an assignment to the National Shawmut Bank of Boston in connection with the Almond Dam and Tunnel Contract?

A. Yes.

Q. Would you give us some inkling with respect to the nature of that assignment, and explain it, please?

A. In connection with our financing the contract, we made an assignment to the National Shawmut Bank of Boston in October, I believe it was, but that would have to be verified as to the exact date, in 1946, of all moneys due or to become due, which then thereupon were cleared by the Government paying agency to the National Shawmut Bank of Boston.

There came a point, which was just prior to the issuance of the last estimate, the final estimate by the Government, when we were no longer indebted to the bank.

MR. METZLER: I object to that as not the best evidence. All we ask is that they show that the assignment was paid or cancelled.

COMMISSIONER DAY: He can certainly testify with respect to the payment made.

MR. KNOX: The witness is the assistant treasurer. He can testify, as to what his corporation did.

COMMISSIONER DAY: Objection overruled.

[fol. 62] MR. METZLER: Then I do not think this witness' testimony is the best evidence, and I think there should be some direct evidence to show it.

COMMISSIONER DAY: He can certainly testify as to whether he paid the bank. Overruled.

MR. METZLER: Exception.

THE WITNESS: Our indebtedness to the bank was completely wiped out some time prior to the issuance of the final estimate by the Government.

COMMISSIONER DAY: By that you mean you paid the bank?

THE WITNESS: Yes, sir.

COMMISSIONER DAY: All right.

THE WITNESS: It went through the bank in the usual routine and they forwarded it to our local bank in Framingham, in accordance with instructions from us. So we owed the bank nothing whatever.

BY MR. KNOX:

Q. Mr. Sullivan, when you refer to the final estimate, do you recall when that was issued?

A. The final estimate? I can get that and present it later, in precise terms, but I believe it was the latter part of the year 1949, but I am not sure. I can verify it by my records.

Q. Mr. Sullivan, referring to certain exhibits which have been introduced, which consisted of various pieces of [fol. 63] correspondence, a number of these pieces of correspondence, namely, Exhibits Nos. 7, 9, 14, 18-A, 20, 22, 23 and 33, they bear at the bottom of the letter the typewritten notation "T. R. Sullivan."

Will you state whether these letters were prepared by you?

A. Yes, I wrote them.

Q. So that every letter bearing that notation is a letter prepared by you, is that right?

A. That is correct.

Q. Mr. Sullivan, I understand you have checked your records?

A. Yes, sir.

Q. Can you state now what was the date of the final estimate on the Almond Dam and Tunnel Contract?

A. The final estimate No. 37-A was dated February 8, 1950, and it was paid, and the Army's check was received by the National Shawmut Bank on—

MR. METZLER: I object again to the witness testifying from documents not in evidence, as to the source of his information.

THE WITNESS: This is in evidence.

MR. METZLER: This is not in evidence.

COMMISSIONER DAY: He can use it to refresh his recollection, I believe.

[fol. 64] MR. KNOX: That is what he is doing.

MR. METZLER: I will concede that, Mr. Commissioner, if that is what he is doing.

THE WITNESS: This is the facts.

MR. METZLER: I want the facts. I am not quibbling about technicalities. If you have some document which shows the facts, let us have it and get it over with.

THE WITNESS: I don't know whether we want to introduce this or not.

MR. KNOX: Off the record for a minute, please, Mr. Commissioner.

COMMISSIONER DAY: Off the record.

(Discussion off the record.)

COMMISSIONER DAY: Back on the record. Read the answer, Mr. Reporter.

(Answer read.)

BY MR. KNOX:

Q. Will you continue?

A. It was cleared through the National Shawmut Bank from Baltimore on March 14, 1950. The amount of the check was $12,736.56.

Q. So at the time that this check was cleared all payments had been made to the Shawmut Bank; is that correct?

A. Previously.

Q. Previously?

[fol. 65] A. All of this, so there was nothing to be applied by the Shawmut Bank against any indebtedness of ours. It simply went through the mechanics of transferring the funds.

MR. METZLER: Same objection.

COMMISSIONER DAY: I am going to sustain that objection. What happened to the check?

THE WITNESS: The Shawmut Bank cleared the check through our local bank at Framingham, the Framingham National Bank, as a routine procedure.

COMMISSIONER DAY: In other words, it was deposited to the account of the Bianchi firm by Shawmut?

THE WITNESS: Yes, sir, because Shawmut had no claim on it.

COMMISSIONER DAY: In full?

THE WITNESS: That is right.

MR. KNOX: Mr. Metzler, I have concluded my examination of Mr. Sullivan.

CROSS-EXAMINATION

BY MR. METZLER:

Q. Mr. Sullivan, do you have any documentary record in your possession, showing that the assignment which was made by the Carlo Bianchi Company to the National Shawmut Bank of Boston was cancelled? Do you have any documentary record?

A. I have this here, which we just submitted, which is a letter from Mr. Harrington of the National Shawmut, [fol. 66] confirming the fact that the assignment was terminated on March 14th.

Q. Just answer the question, Mr. Sullivan, and don't testify about various documents unless you are asked.

I asked you, do you have any document of the Carlo Bianchi Company?

A. Right in my possession here?

Q. Yes.
A. No.
Q. Does such a document exist?
A. I believe we have documentary evidence as to the status, because we would have a record back in our safe of the termination of the assignment.
MR. METZLER: I ask that that be produced. Otherwise, I ask you to strike the testimony of the witness because it is not the best evidence. It should be a very simple matter, Mr. Commissioner.
MR. KNOX: Mr. Commissioner, the witness has testified, in his official capacity as Assistant Treasurer, of his own knowledge, as to what transpired, and I think under those conditions the testimony should be considered.
COMMISSIONER DAY: There are two factors. He is asking you to produce something, if it is available. Is it available?
MR. KNOX: If it is available, we haven't any objection to that, if the document is in existence.
THE WITNESS: There is evidence of the termination [fol. 67] of the assignment.
MR. KNOX: Off the record for a minute, please.
COMMISSIONER DAY: Off the record.

(Discussion off the record.)

COMMISSIONER DAY: Back on the record. Is the Shawmut Bank here in town?
MR. KNOX: Yes, they are right across the street.
COMMISSIONER DAY: They have got records, too.
MR. METZLER: This was the proposition raised in connection with the collection of documents sent to the Plaintiff.
COMMISSIONER DAY: You know what the situation is with respect to the assignment, do you not?
MR. METZLER: No, sir. We have a copy of the assignment originally made which was pleaded in the answer, but as to what went on after that, we do not know.
COMMISSIONER DAY: You do not know?
MR. METZLER: No, that would not be something of which the Government would have knowledge.

COMMISSIONER DAY: Yes, you would.

MR. METZLER: Not of a cancellation.

COMMISSIONER DAY: Yes, you would. If they have it, they will produce it, but I am going to overrule the motion to strike the testimony.

Go ahead with your cross-examination.

MR. KNOX: Mr. Commissioner, we may produce the [fol. 68] Vice President of the National Shawmut Bank. If you want him, he is right across the street.

COMMISSIONER DAY: All right.

MR. METZLER: That is up to you. My question is simple. I am trying to get the best evidence of what transpired. No further questions of this witness.

COMMISSIONER DAY: You may step aside, Mr. Sullivan.

(Witness excused.)

MR. KNOX: Mr. Thomas A. Coyne.

THOMAS A. COYNE, a witness produced on behalf of the Plaintiff, having been first duly sworn by said Commissioner, was examined, and in answer to interrogatories testified as follows:

DIRECT EXAMINATION

BY MR. KNOX:

Q. Mr. Coyne, will you give your full name and address?

A. Thomas A. Coyne, Belknap Road, Framingham, Massachusetts.

Q. Did you give the address?

A. Belknap Road.

Q. Will you state your occupation or profession?

A. I am a civil engineer.

Q. Are you employed by Carlo Bianchi and Company, Inc.?

A. Yes, sir.

Q. In what capacity?

A. General Superintendent.

[fol. 69] Q. For what period of time have you been employed by this company?

A. Since 1937.

Q. In the same capacity?

A. In the capacity of Superintendent and General Superintendent.

Q. Will you state the nature of your training and experience as a civil engineer?

MR. METZLER: Mr. Commissioner, so that the record will be as clear as I can make it with respect to the objection, it appears that this witness' previous testimony before the Corps of Engineers Claims and Appeals Board was taken, and I submit that no evidence, other than what was given before the Engineers Claims and Appeals Board, is admissible unless it is directed to show that in some way that Board acted arbitrarily, capriciously or in a grossly erroneous manner, or that the record before that Board was not supported by substantial evidence.

I submit that the witness is not permitted to testify as to this matter de novo.

COMMISSIONER DAY: As I indicated earlier, if we had a little more direction from the Court in this matter, I would be in a better position to make an intelligent ruling. However, I am going to admit any testimony that is relevant or material, and I will keep your objection in mind.

[fol. 70] MR. METZLER: So that I do not have to repeat it, may my objection go to the testimony of other witnesses as well as to Mr. Coyne's testimony?

COMMISSIONER DAY: Yes, sir.

MR. METZLER: All right.

* * * *

[fols. 71-126] * * *

[fol. A] PLAINTIFF'S EXHIBIT #1

HEARING ON THE APPEAL

of

CARLO BIANCHI AND COMPANY, INC.

C & A NO. 14

17 June 1948

[fol. 1] The meeting was convened by Colonel Mielenz, Chairman of the Board, at 10:00 a.m. on 17 June 1948 in the Office of the Chief of Engineers.

BOARD MEMBERS:

Colonel L. E. Mielenz
Mr. F. T. Johnson
Mr. H. H. Rice

GOVERNMENT REPRESENTATIVES:

Mr. W. H. Fox, Trial Attorney
Mr. R. H. Trites, Engineer
Mr. C. B. McGavock, Jr., Geologist, Baltimore DO
Mr. D. E. Mather, Resident Engineer, Almond Dam
Mr. Dale A. Losey, Assistant Resident Engineer
Mr. David C. Congleton, Chief, Dam Design Section, Baltimore DO
Mr. Deland, Baltimore DO

APPELLANT'S REPRESENTATIVES:

Mr. Peter M. Bianchi
Mr. Fermo A. Bianchi
Mr. Thomas R. Sullivan
Mr. Thomas A. Coyne, General Superintendent
Mr. Elford H. Richardson, Civil Engineer
Mr. Walter Dunham, Cabot Construction Company
Mr. Everett Diehl, Engineer, Cabot Construction Company
Mr. Irving B. Crosby, Geologist
Mr. Miles N. Clair
Mr. Charles A. McCarren, Counsel

MIELENZ: The meeting will please come to order. This is a meeting of the Claims and Appeals Board appointed by the Chief of Engineers to hear such cases as may be brought before it. The meeting will be informal in nature. The Government attorney will present the pertinent facts in the case after which the appellant will have an opportunity to produce his evidence and make his arguments. Are there any questions? If not, the meeting will proceed.

Statement By Mr. Fox

FOX: May it please the Board. This morning you are concerned with C&A Board Appeal No. 14 which is the appeal of Carlo Bianchi & Company, Inc., of Framingham, Massachusetts, having to do with contract No. W 30-180 eng-397 dated 3 July 1946. The contract has for its purpose the construction of Almond Dam. It is a unit price contract consisting of 66 various units. The estimated cost consisting of these unit prices was $3,330,330. It contains the usual standard provision found in all Government contracts. For the benefit of the Board, I have had prepared copies of certain pertinent contract provisions so that you may be able to follow [fol. 2] the facts more closely as we proceed with the factual history of the appeal. At this time I would like to distribute these copies. A very important part of this contract was the construction of a tunnel. You will be concerned with that portion of the contract having to do with the tunnel construction. For that purpose, I would like to call your special attention first to page 3 of the contract provisions which I have distributed where you will find Item 11 in the estimated quantity of 35,500 pounds of steel liner plates and Item 12 for 26,500 pounds of steel tunnel supports. I have quoted the whole of section 4 of this contract for your convenience which is the Tunnel Section. This section tells in minute detail how this tunnel is to be built. In order that you may have a more visual idea of this claim, I have here pictures taken of the actual tunnel during construction. I would like to show counsel for the appellant these pic-

tures and ask whether he has seen these pictures which purport to be actual pictures of the tunnel.

McCARRON: I think we agreed, Mr. Fox, that either party could introduce photographs and they would be used. While I may not have seen all the photographs to which you refer, I understand they purport to show the Almond Dam at various stages of construction.

FOX: This tunnel is approximately 13 feet in diameter. From a construction standpoint it is materialistic that they were to bore through to 710 feet. After boring through, they were to construct a concrete tunnel. How they were to construct that is the subject of the controversy. Coming to that part of the contract provisions contained in Section 4, I believe it sufficient at this time to tell the Board that those provisions contain in minute manner how this tunnel shall be constructed. In all probability when the Government purchased the site of the construction they referred back again to those contract provisions. At the time this contract was originally entered into, this contractor submitted to the Government a progress schedule which indicated his proposed method of operation. Item 10 indicates that for tunnel (a) driving the value was $122,000. He had proposed to start tunneling about 15 October and to complete the tunneling in February of 1947. As for the concreting, he had originally proposed to do that soon thereafter; that is, on April 15, 1947, to commence the concreting and to complete the concreting on or about August 30, 1947. This was his original plan. As a matter of fact, the tunnel operations commenced on December 11, 1946, and were completed on March 11, 1947, on an over-all basis. However, on the concrete lining part of the tunnel, you will recall that the original plan was to commence concreting on or about April 15, 1947. Due to reasons unknown at this time, the concreting in this tunnel was not commenced until 17 December 1947, or approximately eight months after he had originally planned commencing, and was completed along about May of 1948. Concreting was completed this year, as a matter of fact. The contract provisions are very specific on that point. They provide that concreting is

to commence soon after the tunnel is bored. They provide that that is when the concreting is to be done. It was eight months after the tunnel was bored that this con- [fol. 3] crete was actually placed. You will be concerned specifically with the tunnel protection in this appeal. The contract provision relating to tunnel protection and the drawings themselves as contained on page 24 of the contract drawings are very specific. Page 24 is the tunnel section of this particular tunnel. It explains in very minute detail the design features of the tunnel, the entrance, outlet and length of the tunnel. This tunnel has an over-all length of some 710 feet. You will notice that at the entrance of the tunnel for the first 50 feet tunnel protection is to be furnished and at the outlet end for 50 feet protection is to be furnished. By tunnel protection is meant liner plates, steel ribs, including tie rods and spreaders. I have what I believe is a picture of the liner plates and steel ribs. The 50 feet showed here is these various liner plates and ribs. Here are the ribs and the steel liner plates going in between the ribs. Here is another excellent picture of this tunnel protection. It is not only a contract drawing requirement but it is also a contract specifications requirement that the first 50 feet be lined with permanent tunnel protection. That provision is contained in paragraph TP 4-03, Tunnel Protection, Scope, and I quote:

> "Tunnel protection shall be furnished and placed as required for distances of approximately the first 50 feet of each end of the tunnel which includes the underground portion of the outlet transition. Such tunnel protection conforming to the cross sectional shape of the tunnel and transition, shall consist of steel arch ribs and corrugated steel liner plates as indicated on the drawings or required, including tie rods and spreaders. * * *."

Calling your specific attention to paragraph TP-4-02, Tunnel Excavation, Scope, the first two sentences thereof provided:

"The tunnel bore may be driven from either or both ends by any of the usual methods of tunneling, provided the driving is continuous and progress is consistent with that indicated on the progress schedule. Temporary tunnel protection shall be provided where required for safety of the workmen and shall be placed progressively after each heading blast and prior to resumption of excavation and drilling operations. * * *"

It is a fact and your records show that early in December 1946 before the tunnel had been bored possibly 30 feet, the Cabot Construction Company, who was the subcontractor on the project, requested permission of the Resident Engineer, Mr. Mather, to continue placing the tunnel protection throughout the length of the tunnel. Your records will show, and we will be more specific [fol. 4] on that point when the Government presents the case, that in answer to that request the Cabot Construction Company was advised that at that time it was impossible for the Resident Engineer to determine whether this type of protection was necessary. With that information the tunnel operation would proceed as originally planned with protection for the first 50 feet and continue on through the whole 710 feet. It is a fact that for the first 50 feet this tunnel protection, a picture of which you have seen, was placed. On March 11, 1947, or about four months after the tunnel operations commenced, they advised they had bored through. The Cabot Construction Company did not at any time between these 50-foot areas at the beginning or end place during the construction any temporary or permanent tunnel protection for its workmen. They just bored through without any protection. It seems that about April 1947, about a month after the tunneling was through, this contractor again requested the Resident Engineer for permission to place this tunnel lining throughout the whole length of the tunnel. This request was reviewed with the result that much correspondence took place between the parties with the end result that some time in October 1947 the contracting officer in a formal opinion denied permission to the

contractor to place this permanent tunnel protection the whole length of the tunnel, i.e., he denied it to the extent that it would be at the Government's expense. Prior to that time the appellant, to his inquiry as to whether or not he would be permitted to place the tunnel protection in the whole length of the tunnel, was advised that in the Government's opinion that, first, it was not necessary, and second, that if he did place it, it would be at his own expense. With that information, it is a fact that the contractor did place throughout the whole length of the tunnel this tunnel protection which you see here. It is a fact that the tunnel, and here is an excellent picture of it, is completely lined with the tunnel protection. This appellant asks you to reimburse him for the cost of that tunnel lining. The contracting officer has denied liability and you are now called upon to sit in judgment as to whether or not under the terms of the contract this appellant is entitled to payment for placing this tunnel protection the whole length of the tunnel. Those are the facts as the Government sees them at this time.

MIELENZ: The counsel for the appellant may proceed.

STATEMENT BY MR. MCCARRON

McCARRON: For the purpose of the record, I am Charles A. McCarron, counsel for appellant. Perhaps a brief statement, may it please the Board, of the position of the appellant may be helpful in following the evidence as we propose to present it. In many respects there are no substantial differences between the Government and the contractor on certain of the basic facts that will develop in this case. Mr. Fox has clearly stated the position of the appellant to this extent that the appellant has lined this entire tunnel with steel liner plates and appears before this Board asking in equity and good conscience that it be reimbursed by the Government for the installation of these steel liner plates which the contractor felt were absolutely necessary in order to line this tunnel and complete the tunnel job because of the character of the rock that was

[fol. 5] encountered in the course of boring this tunnel, rock which could not be determined by the information available on the contract drawings and cores that were taken by the Engineers prior to award of this contract. It is our contention that as the excavation for the stilling basin, which was the first rock excavation, I believe, began, it became apparent that the character of the rock was of such nature that there existed a real possibility, if not a danger, that trouble would be encountered in the boring of the tunnel, or more specifically, in the lining of the tunnel. That fact was called to the attention of the Resident Engineer and I want to preface that remark by saying that I have no intention to indulge in personalities or level criticism but to state the facts as I understand them. That fact was called to the attention of the Resident Engineer and it was suggested to him that there did exist a real possibility that the rock inside the tunnel, from what was then apparent, would present a serious condition. The Resident Engineer said he did not think that was so, and there would be no need for additional steel liner plates or permanent protection. He referred at the time to the job of the Arkport Dam which is less than four miles from this job and with which he had considerable to do and which, I understand, was holed out and lined without any serious trouble. The work of boring the tunnel began and the conditions which were anticipated rapidly made themselves manifest. Under the terms of the specifications referred to by Mr. Fox, it does not provide specifically for steel liner plates for a distance of 50 feet at both ends—both inlet and outlet. During the course of this controversy as the correspondence between the parties develops, you will see that there has been quite a distinction made between the use of the words "temporary protection" and the words "permanent protection." An examination of the specifications will disclose that the only place that the words "temporary protection" are used is in connection with providing temporary protection for workmen during the course of the work. It is the contention of the contractor that protection to the tunnel roof which is not

removed in the finished tunnel cannot by any stretch of the imagination be called temporary. That is permanent, and that type of protection which was installed in this instance is permanent and not temporary. In other words, as Mr. Fox has stated, it is there as long as the tunnel remains. After about 50 feet of this tunnel has been bored—oh, in that connection, I will call attention to one phase of the specifications that had been referred to by Mr. Fox, namely, TP 4-03 *c.*, Steel Liner Plates, which provides for the placing of steel liner plates for tunnel protection in the tunnel sections where such protection material is indicated on the drawings, or as directed, to furnish coverage for the tunnel roof section above the spring line. No mention is made in that section or anywhere else of protection of workmen as temporary. The 50 feet specifically provided at inlet and outlet sections were for the purpose of furnishing coverage for the tunnel section above the spring line, and it is our contention that direction from the Government to the contractor to install this permanent tun- [fol. 6] nel protection under the conditions that existed was unreasonably withheld. As I said, it will appear that after the first 50 feet of the tunnel had been excavated and the installation of these steel liner plates more or less completed, permission was given by the Resident Engineer to extend the liner plates further, but the contractor was to replace those steel plates which might be damaged. The matter was again taken up with the Resident Engineer—and I may be skipping some of these numerous conferences because this was a constant discussion—the Resident Engineer stated that he did not intend to order in any more steel on this tunnel. There was a visit to the job some time early in January by representatives of the Baltimore Office, at which time I think the first 50 feet had been completed, and there was exposed beyond that perhaps six feet not protected. The opinion was expressed that the rock looked pretty good, and they thought the contractor could get through all right, but if conditions changed as the tunnel was bored they would have to give further consideration to the matter. At no time has the Resident Engineer con-

ceded that the contractor is entitled to be paid for the installation of permanent tunnel protection, or protection in the form of these steel plates, or any other protection that was to remain permanently in the tunnel beyond the 50 feet I have described. The tunnel was bored through and almost immediately after that large failures of rock occurred. As a matter of fact, it will appear here that since the steel liner plates installed beyond the 50 feet were removed as directed there was a substantial fall of rock in the very early stages of the construction of this tunnel. Then, after the tunnel was holed out, within the first 30 days, very substantial falls of rock occurred. I have here three photographs taken April 25, 1947, which is about six weeks after the tunnel had been holed out and about a month after it had been cleaned out. These pictures show conditions as taken from the inlet and outlet ends, taken at that time. I think you have seen these, Mr. Fox. Those are the ones I showed you before. (Shows pictures to Board members who examine them). Now, the Board will have in mind that under the terms of these specifications no concreting could be done in this tunnel until the tunnel had been completely holed out. The Resident Engineer, in the exercise of his judgment, as I see the picture develop, came to the conclusion apparently that some form of tunnel protection was going to be required, and his views could be crystallized from the conversations that took place as follows: "If tunnel protection is to be required, you, the contractor, put it in, but you put it in at your own expense." I refer the Board specifically to a letter from the Resident Engineer dated 10 January 1947, which is Engineer Exhibit "E" of the contracting officer's statement of fact, and to another letter by the Assistant Resident Engineer dated 15 April 1947, Engineer Exhibit "J." We don't agree with some of the conclusions stated in those letters, but we do submit that from an engineering standpoint the letters are strong evidence of the fact that the Engineers recognized that conditions within the tunnel required a form of protection in order to line the tunnel, and you will note, gentlemen of the Board, that in those letters

reference is still made to temporary protection, although the talk is all about the installation of a type of protection that is to remain in the tunnel for eternity. [fol. 7] Now, briefly, as I have stated, the position of the contractor is not one of seeking to come in here to put a distorted meaning on the specifications or asking to be paid for something that he hasn't done. We ask that we be paid for work which we say was absolutely necessary and without which this tunnel could not have been lined with concrete as required. With reference to the comments made by Mr. Fox relative to the apparent delay in holing out the tunnel and commencement of the concreting, the correspondence and evidence will show that there were a number of conferences and a series of correspondence between the Engineers and the contractor with reference to the matter of this form of protection and later over the type of design that was to be put into the tunnel, it being contended by the Resident Engineer—although in letters of 10 January and 15 April they seem to give approval, but later take the position that it is over-design. They could have enlarged the bore of the tunnel and put up some wood posts or wood lagging as protection. We are not concerned with protecting workmen. The only question is whether or not the conditions found in the process of boring this tunnel, or the condition of this rock was such that good engineering required that some form of tunnel protection must be installed, and whether the Resident Engineer and his associates acted reasonably in withholding that direction, although in substance approving the action of the contractor in installing it, but saying that it would be at his own expense. Substantially, that is the position of the contractor, and we will show by photographs that pictures taken in September, 1947, compared with those pictures taken in April, 1947, show substantially the same condition. In other words, there was no material increase in the fall of that rock. The Government has suffered no damage as a result of this so-called delay, and the contractor has been paid for his concreting. Mr. Coyne, I think we will ask you to tell us something about this. Your full name, Mr. Coyne?

DIRECT EXAMINATION

COYNE: Thomas A. Coyne.

McCARRON: And you live where?

COYNE: Framingham, Massachusetts.

McCARRON: Your business, sir?

COYNE: General Superintendent for Carlo Bianchi and Company, Inc.

McCARRON: You have been in the construction business for how many years?

COYNE: Thirty-five.

McCARRON: What has been the general nature of your experience?

COYNE: I have been in the construction business—connected with it—since 1914, first as Assistant City [fol. 8] Engineer, Marlboro, Mass., in charge of all city installations; later as Engineer for the Water and Sewer Department in the City of Marlboro; and after the war as City Engineer and Superintendent of Streets in Marlboro, Mass., for eight years between 1922 and 1930. From 1930 to 1937, Superintendent of Public Works in the Town of Framingham, and since 1937 as Superintendent for Carlo Bianchi and Company, Inc. My experience goes through all phases of construction—heavy construction, sewer and water installations, bridge construction, dam construction, and what is generally met in the construction industry.

McCARRON: You were the superintendent on this Almond Dam project?

COYNE: Yes, sir.

McCARRON: Prior to the submitting of the bid by the contractor, did you visit the site of the job?

COYNE: I did.

McCARRON: Accompanied by whom?

COYNE: I was accompanied by Mr. Peter Bianchi, President of the Company, and Elford H. Richardson, the Chief Engineer for the company.

McCARRON: And briefly, just what did you do by way of examination of the site?

COYNE: We spent the better part of two days examining the site previous to the submission of the bid. We went to the location and familiarized ourselves with

all the surface conditions that existed. We went up on to the railroad; went up and down the railroad for a half a mile on each side of the proposed work, and on the railroad protection embankment. We visited the various borrow areas and examined at that time the test pits and borings as shown on the drawings. We visited the tunnel inlet, the location of the diversion channel, and in general looked over the whole area for everything that a survey, superficial as it was, would indicate, plus whatever information we gleaned from the contract drawings, particularly in regard to the test pits.

McCARRON: Was is the intention of the Bianchi Company, Mr. Coyne, to do the work of driving this tunnel itself or by subcontract?

COYNE: It was our intention to employ a subcontractor.

McCARRON: Had the Bianchi Company done tunneling work?

COYNE: No, we had not.

McCARRON: Had you discussed the driving of the tunnel with a subcontractor prior to the placing of your bid?

[fol. 9] COYNE: Yes, we had.

McCARRON: Who was the concern? Was that the Stieffel Company?

COYNE: Yes, the Stieffel Company of New York City.

McCARRON: Mr. Stieffel was subsequently killed in an automobile accident visiting the job?

COYNE: Yes, sir, that is true.

McCARRON: And it was carried on as Cabot Construction Company?

COYNE: Yes.

McCARRON: And the Cabot Construction Company was given the subcontract?

COYNE: Yes, that is correct.

McCARRON: Did you visit Ithaca, New York, to examine the cores?

COYNE: No, we did not.

McCARRON: The information you had as to the character of the rock in the tunnel—was that contained primarily on the contract drawings? Is that correct?

COYNE: That is correct.

McCARRON: The details with reference to the matter of driving of the tunnel and what should be done so far as the construction of the tunnel was concerned you left to your tunnel subcontractor?

COYNE: We discussed it with them previous to submitting our bid and discussed all pertinent phases of the contract which we were to sublet to them regarding the driving of the tunnel.

McCARRON: As Mr. Fox has stated, the contract price was 3,300,000 some odd dollars. Approximately what percentage was represented of the job itself by this tunnel?

COYNE: Probably six to seven per cent.

McCARRON: Of the entire job?

COYNE: Of the entire job.

McCARRON: The work began and, as I understand it, and as stated in my opening statement, the Cabot Construction Company proceeded with the excavation of the stilling basin, so-called.

COYNE: Yes.

[fol. 10] McCARRON: When did you first have any occasion to be present at or participate in any talks with the Resident Engineer or his assistant or any Government officials relative to the condition of the rock that was being encountered in the course of excavation?

COYNE: I talked with the Resident Engineer shortly after the commencement of the rock excavation in the open cut in the stilling basin regarding the character of the rock, the mud seams and the difficulty which we might encounter in holding to the pay lines on the job because of the mud seams, and stated at that time that the vertical wall of the stilling basin would probably not stand, and that we should be paid for overbreak rock and the design changed so that there would be a slope of approximately 4 on 1 for that rock.

McCARRON: What was the Resident Engineer's answer to that?

COYNE: The Resident Engineer said he had no authority to pay for any rock excavated beyond the pay lines. He did agree with me that the design of a vertical wall in the stilling basin was a departure from the usual custom.

McCARRON: When did you next have occasion to be present at a conference or to discuss with the Resident Engineer or his associates relative to the character of the rock encountered in this tunnel?

COYNE: During the progress of the excavation of the rock in the stilling basin. As we got deeper and deeper into the rock, the characteristics remained the same, and we talked with the Resident Engineer regarding the possible difficulty that we would encounter in the tunnel, as well as in the stilling basin, if the mud seams—cross seams—continued as they had.

McCARRON: You go right ahead, Mr. Coyne. I don't need to keep on asking these questions. Just go ahead and give a continuity of the discussions at which you were personally present, specify as well as you can remember who else was there, and confine your discussion to your own position and the position taken by the Resident Engineer and his associates.

COYNE: The conversations that we had had on the job culminated in a conference in Baltimore on December 10, 1946, at which time we presented to the District Engineer, Colonel Seybold, and other members of his staff, our request for the establishment of new pay lines in the stilling basin, and at that same conference we discussed the probability of the necessity for protection in the tunnel. We requested that the Engineers give consideration to continuing the protection wherever necessary in the tunnel and suggested that inasmuch as we only had approximately 100 feet of ribs and liner plates for tunnel protection on the job, that if protection was judged necessary, we would continue at the outlet portal from which we started the driving of the tunnel to erect tunnel protection for approximately 100 feet, and in the meantime order in more steel ribs and liner plates so that there would be no delay in the tunnel driving. At that time Colonel Seybold told us that he would

[fol. 11] meet us on the job and discuss this particular phase with us on the job. Some time between then and Christmas we requested that it be before the 20th of December because we did not wish to be tied up Christmas week. Shortly after that, perhaps the next day, Colonel Seybold came to the Almond Dam site. We did not confer with him as he did not visit our office. Later we wrote requesting to know when he would meet us on the job and he replied that we must be mistaken because he had not indicated that he would have a conference on the job with us. The first ground drilling on the tunnel started, to the best of my recollection, on December 12 and was suspended during the Christmas holidays and resumed again shortly thereafter and I did not return to the job until January 13 from the Christmas holidays.

McCARRON: Were you away from the job because of illness?

COYNE: Yes.

McCARRON: Passing over the interval during the time you left the job and your return on January 13, what did you find the situation to be upon your return with relation to the question of the character of the rock encountered and the meetings or discussions on the matter of protection of the tunnel itself?

COYNE: When I returned on January 13 the driving of the tunnel had progressed to a point probably 12 or 14 feet beyond the protection that had been erected and I had a conference with Peter Bianchi and Everett Diehl, he being the engineer and superintendent of the Cabot Construction Company on the job, relative to tunnel protection. About this time we requested permission of the Resident Engineer to use some of the steel ribs already on the job to furnish temporary protection beyond the 50 feet and with the stipulation that those ribs would be removed at a later date and installed in the inlet portal. That permission was granted and we erected, to the best of my recollection, four sets of steel arch ribs beyond the 50 feet which remained in place until it was necessary to remove them for installation at the inlet portal where the tunnel was holed out and

upon removal of the four temporary laggings the roof of the tunnel crashed in and had to be removed.

McCARRON: When you returned to the job on January 13 were you made aware of a letter received from Mr. Mather, the Resident Engineer, dated 10 January 1947, Exhibit F?

COYNE: Yes, I was.

McCARRON: As the result of that letter and the conference with Mr. Diehl and Mr. Bianchi did you write a letter to Mr. Mather under date of January 14, 1947, which is contractor's Exhibit A?

COYNE: Yes, I did.

[fol. 12] McCARRON: I shall not deem it necessary to make you read them as they are part of the record.

COYNE: Yes, sir.

McCARRON: Picking up from there, was there another series of conferences or visits to the job on the matter relating to the tunnel protection and character of the rock?

COYNE: About the character of the rock encountered (interrupted by Mr. McCarron).

McCARRON: Before you answer that—you did not then bother about the extra feature of the additional liner plates remaining in place until it became necessary to put them in the inlet end and that was toward the latter stage of boring of the tunnel?

COYNE: No, sir.

McCARRON: And they remained in place during the several weeks or months required to reach the end of the tunnel and then they were removed?

COYNE: Yes.

McCARRON: And then the roof of the tunnel fell in?

COYNE: Yes.

McCARRON: You may proceed.

COYNE: During the process of driving the tunnel the character of the rock did not seem to change. The tunnel was successfully driven by Cabot Construction Company and very carefully done and they were always vigilant, going in and out of the tunnel or chamber with experienced men to scale down any rock that looked dangerous and by dint of that eternal vigilance they

were able to successfully hole out the tunnel on March 12, I believe.

McCARRON: Were there any accidents to the workmen?

COYNE: None of any serious nature. There was no lost-time accident in the driving.

McCARRON: Getting back to the question of these various conferences, are there any others in which you participated with the Resident Engineer, his assistant, or representatives of the contracting officer that you haven't told us about or that you can now recall?

COYNE: I did have, on several occasions, conferences with the Resident Engineer or his assistant regarding tunnel protection. The answer was always the same—tunnel protection was not necessary and the Government would not install tunnel protection at its expense or reimburse the contractor for it.

[fol. 13] McCARRON: At any time during the course of the discussion with the Resident Engineer or his assistant was mention made or comparison suggested between the character of the rock at Almond Dam and the character of the rock that had been encountered at Arkport?

COYNE: Yes.

McCARRON: Tell us about that.

COYNE: The Resident Engineer informed me he was entirely familiar with the type and character of the rock in the vicinity and it was the same at Arkport and he knew what condition to expect.

McCARRON: Mr. Coyne, you are familiar with the specifications on this job. Let me direct your attention to the provision of Section Tp 4-03 entitled "Tunnel Protection" which consists of three parts: *a.* Scope; *b.* Steel Tunnel Protection Supports; and *c.* Steel Liner Plates. What consideration did you give to the matter of the possibility of additional steel tunnel protection supports being beyond the 50 feet referred to in Specification TP 4-03, Scope?

COYNE: At the time we bid the job?

McCARRON: Yes.

COYNE: When we bid the job we felt that the tunnel protection as designed would be adequate and the specifications were broad enough to permit any extensions of tunnel protection that were necessary if it developed so we gave no consideration to any protection beyond that shown in the contract drawings and did not include any item for that particular protection.

McCARRON: And with reference to the provision of the specifications where tunnel protection is indicated on the drawings or directed by the contracting officer, what consideration did you give in submitting your bid as to who would pay for additional tunnel protection as directed by the contracting officer in the event such tunnel protection was deemed to be necessary?

COYNE: That the Government would pay the contractor for such protection.

CROSS EXAMINATION

McCARRON: Your witness, Mr. Fox.

FOX: In that last statement, Mr. Coyne, I believe you said in interpreting this contract when you bid the job it was your feeling under this contract that if protection was necessary the Government would pay for it. Is that right?

COYNE: Yes, sir.

FOX: Will you be kind enough to show us under what pay item you intended to be paid? Did the contract contain a pay item for that?

[fol. 14] COYNE: Yes. To the best of my knowledge, it is Item 12.

FOX: Here is a copy of the contract, Mr. Coyne, and here are Items 11 and 12. Under Item 11 we have an estimated quantity of 35,500 pounds steel liner plates and under Item 12 we have an estimated quantity of 26,500 pounds of steel tunnel supports, both at a unit price of 15 cents. Would you say that poundage represents the 100 feet shown in the drawings?

COYNE: To the best of my knowledge it does.

FOX: Mr. Coyne, was it your intention to concrete the tunnel?

COYNE: Yes.

FOX: Did you, prior to the bid or any time after bidding, request bids from subcontractors for this concreting?

COYNE: Yes, we did.

FOX: About how many?

COYNE: Two, to the best of my knowledge.

FOX: Has your firm ever concreted a tunnel of this length before?

COYNE: No, we have not.

FOX: You have told this Board that you yourself did not examine the cores. Did the Cabot Construction Company?

COYNE: I do not know whether they did or did not.

FOX: You told the Board that as you got deeper into the tunnel the characteristic of the rock remained the same. Will you elaborate on that? Was it the same specimen of rock, etc.?

COYNE: The general pattern of the rock in the tunnel was vertical seams every two or three feet on the side walls of the tunnel and vertical seams at approximately right angles to that and parallel to the axis of the tunnel at slightly, it appeared to me, greater distances—three to five feet.

FOX: Mr. Coyne, is it true that the tunnel was completely holed through in March?

COYNE: Yes, this is correct.

FOX: Was it at that time or after that time that you requested bids of subcontractors for this concreting, do you remember, Mr. Coyne?

COYNE: We requested, to the best of my knowledge, the Cabot Construction Company to consider the concrete lining of the tunnel.

[fol. 15] FOX: Was it prior to the holing through?

COYNE: Yes.

FOX: And that deal fell through?

COYNE: It fell through because they got another job at Union Village (name not verified).

FOX: After you holed through the tunnel did you inquire of others for subbids on this job?

COYNE: I believe so. I would not be as thoroughly familiar as the Framingham office because inquiries for subcontracts do not issue from the field but rather from the Framingham office. I am not familiar with that.

FOX: Mr. Coyne, if you will read with me the first two sentences of specifications TP 4-04 wherein the following is quoted:

> "The entire tunnel bore including the outlet transition shall be lined with concrete which shall conform to the applicable requirements of Section X. No tunnel concrete shall be placed prior to the completion of the entire tunnel bore, then its placement shall be expeditiously prosecuted to completion."

Calling your attention to that last sentence, will you tell the Board what expeditiously prosecuted to completion was?

COYNE: To expeditiously prosecute means to hasten and hurry and it should have followed as soon as possible after the tunnel was bored.

FOX: Why?

COYNE: Well, it is a matter of good engineering practice to follow one operation with another.

FOX: Isn't it a fact that due to climatic conditions, the wind entering into this tunnel during the winter, would tend to deteriorate the rock condition in the tunnel?

COYNE: Climatic conditions, whether winter or summer would do that.

FOX: That would have some tendency to deteriorate the rock in the tunnel.

COYNE: The deterioration of the rock in the tunnel, in my opinion, was negligible.

FOX: You did complete the tunnel—the holing through—in March 1947 and some time in August 1947 you started cleaning out and also started placing this tunnel protection. Is that right?

COYNE: Yes. Now, if I may be permitted, I would like to expand on the holing out and the cleaning up

[fol. 16] by Cabot Construction Company. The holing out was completed about March 12. The cleaning up of the tunnel was not completed until March 25.

FOX: So that on that date had you been ready you could have concreted, is that right?

COYNE: We would not have placed it at that time because of the winter weather. We had not scheduled it until about the middle of April because we did not want to set up for winter concreting.

FOX: All right. Would you say that "expeditiously" here is used in a sense that within a reasonable time after the tunnel is holed through? Will you give me the reasonable time you would start the concreting?

COYNE: Concerning this time, it would have been when the weather conditions permitted the ordinary concrete set-up and that, I would say, would be about the middle of April or the first of May.

FOX: So that in the year 1947 you could have, had you been prepared, or the subcontractor could have commenced this tunnel concreting work in April or May?

COYNE: No, we could not.

FOX: Why?

COYNE: Because the roof of the tunnel started cracking during the clean up, it fell and rock continued to fall from the roof of the tunnel from then until the time the supports and the liner plates were installed by us and at no time after that would it have been possible without protection to have concreted that tunnel.

FOX: How extensive were these rock falls?

COYNE: They were quite extensive throughout the entire length of the tunnel. The greatest falls occurred near the portals. At the inlet portal the greatest falls were for about 180 feet beginning at a point about 75 feet in from the inlet portal and at the outlet portal the greatest fall occurred for about 60 feet.

FOX: About 60 feet beyond the original tunnel protection? We are speaking of that footage between the 50-foot inlet and 50-foot outlet.

COYNE: That is right.

FOX: Will you indicate where those failures occurred and the length of the failures?

COYNE: I don't believe I could give you that, exactly.

[fol. 17] FOX: Just approximately.

COYNE: On the inlet end you take the 50-foot protection (interrupted by Mr. Fox)

FOX: Go beyond that, please.

COYNE: Then 75 feet beyond that for approximately 180 feet—now that would be approximately 21+71 that it started, right about there (indicating on drawing) and you continue 180 feet which would bring us to 21+75, to about there, I would say (indicating on drawing). On the outlet end it started, to the best of my recollection, about 25 feet from the end of the protection and the greatest falls occurred for about 60 feet which would be in here (indicating) and other lesser falls occurred throughout the entire length of the tunnel. The greatest falls were at these locations I have given you, right here and here (indicating and the lesser falls here (indicating).

FOX: What is the approximate length of those falls?

COYNE: This here, I remember, was about 180 feet.

FOX: So over a 180-foot area there were extensive falls which would endanger the lives of the workmen working in the tunnel?

COYNE: At the outlet portal the most extensive falls occurred at about 60 feet, to the best of my recollection.

FOX: When did these falls occur?

COYNE: They occurred immediately after holing out and during the clean up.

FOX: Were they extensive?

COYNE: They were quite extensive during the clean up.

FOX: Did they injure anyone?

COYNE: No, they did not.

FOX: You have worked in tunnels before? Did you consider them dangerous to workmen in the tunnel?

COYNE: I have not worked in tunnels before.

FOX: This was your first one?

COYNE: This was my first one.

FOX: Mine, too. Did you yourself ever see any actual falls?

COYNE: Any actual rock falls?

[fol. 18] FOX: Yes.

COYNE: No, I never saw them but I heard them.

FOX: What was the estimated quantity of the rock fall?

COYNE: The estimated quantity of the rock fall between March 25 and some time in August was about 203 yards, to the best of my recollection.

FOX: How do you arrive at that figure?

COYNE: We took sections with our own survey crew at the time that the tunnel was cleaned out, and we took sections of the tunnel during the process of erecting the protection which the contractor erected and now wishes to be paid for. We took sections in the tunnel with our own engineering crew.

JOHNSON: I thought that claim had been abandoned for the removal of the overbreak. You are not making any claim for overbreak tunnel excavation?

McCARRON: If we had lined the tunnel, then we would have a claim for it. That was with reference to the stilling basin, but is not involved in this appeal. This is limited strictly to tunnel protection.

FOX: During the period March 11 to approximately August 27, at which time you started the tunnel job, on how many occasions did you personally go into the tunnel?

COYNE: Two.

FOX: On two occasions. And on both two occasions, to your knowledge, what occurred as far as falls are concerned?

COYNE: Mr. Richardson, Mr. Riddel and I went through the tunnel together—I don't remember the exact date—and I accompanied another gentleman through the entire length of the tunnel between March 25 and August. I wasn't particularly pleased with the idea of going through there, but I did.

FOX: On two occasions, and did you actually see any falls?

COYNE: No, I heard them.

FOX: On both occasions?

COYNE: I can't recollect exactly. But we were most apprehensive and took it pretty easy going through there.

FOX: Is it possible that the yardage—203 yards—[fol. 19] represents the overbreak caused by the bulldozer cleaning up, and other cleaning operations?

COYNE: That is entirely separate. There were 192 yards involved in the overbreak on the invert due to the bulldozer cleaning up.

FOX: So it is your opinion that approximately 203 yards represents the actual falling of rock?

COYNE: That is right. That is from the side walls and above the spring line according to our computations taken from cross sections—I believe it was 203 yards.

MIELENZ: About what was the total excavation of that tunnel?

COYNE: The total excavation was approximately 2,200 yards. That was the estimated excavation.

MIELENZ: That 203 yards represents all the overbreak, all the amount of rock that fell down as a result of normal falling of rock after the excavation had been made, the first holing through?

COYNE: No, not the first holing through. It fell after the final clean-up on March 25.

FOX: Isn't it a fact, Mr. Coyne, as far as you know, that when Cabot constructed the tunnel he used no form of protection within the 50-foot line, and no one was injured?

COYNE: He did use formal protection.

FOX: How extensive was that?

COYNE: As I recall, four ribs extending 16 feet beyond the outlet portal. When it got to the end of the protection that was to be put in there were four ribs installed at a place where the roof looked very bad. We requested that they be put in as temporary protection, later to be removed.

FOX: And that was done?

COYNE: That was done.

FOX: Other than those four ribs, did he drill through without any mishap of any sort?

COYNE: Yes, sir.

FOX: Are you familiar with the type of protection used during the period March 1947 to August 1947?

COYNE: Yes, sir.

[fol. 20] FOX: What was that protection?

COYNE: That protection was the rib beams and liner plates with spreaders.

FOX: No, I am sorry, I probably gave you the wrong impression. I refer to the entrance to the portal. My question was, are you familiar with the type of protection afforded in this entrance? How did you protect the wind from coming in and out of this tunnel?

COYNE: There was no protection during the driving of the tunnel.

FOX: Fine. And after the driving, sir?

COYNE: After the driving there was a canvas put on the inlet end of the tunnel.

FOX: Was it also placed at the outlet?

COYNE: No, at the inlet, sir.

FOX: Was anything placed at the outlet?

COYNE: To my knowledge, no, there was nothing. I remember that distinctly.

FOX: Here is a picture, Mr. Coyne, taken on June 3 showing the outlet of the tunnel with this protection. Would you say that that is a replica of the picture?

COYNE: Yes, sir.

FOX: Do you know firsthand?

COYNE: No, I do not.

FOX: Do you know whether, after the hole had been bored through, this cover was made secure at all times so as to not permit any entrance of wind?

COYNE: No, I do not. I know the canves was there and it stayed in place.

FOX: (Showing the picture) Would you say that that canvas is in place, sir?

COYNE: Yes, sir.

FOX: (Presenting picture to Board members) At this time I would like to call the Board's attention to this picture taken on July 3 of the tunnel outlet showing the protection afforded the tunnel. You will notice this canvas appears at the outlet section, and it is in such a

position as to admit air. Mr. Coyne, why didn't you some time in April start your concreting operations in this tunnel?

COYNE: Because the fall of rock in the tunnel prohibited it.

[fol. 21] FOX: Isn't it true that the fall of rock continued into August, and you did then place your concrete lining?

COYNE: Only after we had erected protection in the form of steel ribs and liner plates.

FOX: What type of equipment did you use in placing the concrete liner?

COYNE: We used a pumpcrete machine.

FOX: Did you have those available for use in April, May or June of 1947?

COYNE: Yes.

FOX: So it is your view that due to the Resident Engineer's refusal to grant you permission to place this temporary or permanent support you refused to proceed with the concrete lining?

COYNE: We couldn't proceed until protection was provided.

FOX: Did you give thought to placing of temporary supports where needed?

COYNE: Yes, we did.

FOX: What type of temporary support?

COYNE: Several types were discussed both with the Resident Engineer and with the consultants, and we could not devise anything of a temporary nature which would provide the protection necessary in order to do the concrete lining.

FOX: Is it a fact, Mr. Coyne, that having placed this protection in the tunnel during August to October, and having commenced in December in placing this concrete lining, at that time, of course, having this permanent support there, that you could have placed the concrete lining with these supports there and immediately prior to the placing of the lining removed those supports?

COYNE: No, I don't believe so.

FOX: No?

COYNE: In my opinion, no.

FOX: Why? Will you elaborate on your opinion, sir?

COYNE: The tunnel protection was placed, with ribs and liner plates, and the top of the liner places was back-packed with stone between the liner plates and the rock in the roof of the tunnel to pick up the load from the [fol. 22] roof, that is, to protect it from any falling rock above the liner plate, it would have been impossible, or it would not have been feasible to remove the ribs, remove the liner plates, remove the back-packing and then proceed with the concrete lining.

FOX: As a matter of fact, it probably would have been more expensive.

COYNE: It isn't a matter of expense; it is a matter of practicability.

FOX: In your opinion, would the placing of this support add anything to the stability of the concrete tunnel itself?

COYNE: I would say it made it possible to build the tunnel, and it was the only manner in our opinion which we could devise in which the concrete lining to complete the tunnel could be placed.

FOX: In your opinion, would the placing of that tunnel support add to the stability of the concrete lining?.

COYNE: I don't believe I am competent to answer that.

FOX: You have no opinion?

COYNE: That is right, sir.

FOX: Thank you very much, Mr. Coyne.

REDIRECT EXAMINATION

McCARRON: Mr. Fox has directed your attention to certain of these specifications with reference to tunnel support and your consideration of them prior to the submitting of your bid. Did you also give consideration, Mr. Coyne, to Article 4 of the contract relating to changed conditions, which is part of the record in this case, and the details of which I won't read?

COYNE: Yes, we did.

McCARRON: So far as the question of delay, if it may be called that, of installing the concrete lining immedi-

ately or expeditiously after the holing out, was the consideration involved in the delay so far as your contractor was concerned with reference to the protection of the roof of the tunnel so that concreting could be effectively accomplished, or was it because of any problems of subcontractors, or anything of that sort?

COYNE: If I understand your question correctly, the consideration was given only to the problem of lining the tunnel.

McCARRON: Do you know of your knowledge whether conferences were held between the representatives of the contractor and the representatives of the contracting officer in Baltimore with reference to the question of lining the tunnel, the matter of support, prior to the time the installation of these steel I-beams and liner plates was begun?

[fol. 23] COYNE: I believe there was a conference in May which I did not attend because I was ill. I was laid up with an ulcer on my eye.

McCARRON: You were asked by Mr. Fox about the removal, if I understood him correctly, of these steel beams and then proceeding with the concreting and you were also asked about the four ribs that were installed in the outlet section. I may have asked you before—those were removed, were they not?

COYNE: Yes, they were removed.

McCARRON: And what happened to the roof of the tunnel section?

COYNE: Portions of rock fell from the roof.

McCARRON: If you are in a position to express an opinion, in your opinion, if you had followed the method outlined by Mr. Fox and put in some sort of support and then removed it immediately prior to the process of concreting, what would have happened?

COYNE: I don't believe it is feasible from an engineering standpoint to carry on any such operation. It would be dangerous both to the work and to the workmen.

McCARRON: Did you have in mind that in accordance with the language of the specification TP 4-03c. whoever prepared the specification had in mind specifically the 50 feet at the outlet and inlet, and that that was

specifically set forth for the purpose of furnishing coverage for the tunnel roof above the spring line?

COYNE: Yes, sir.

McCARRON: Was that the function for which this subsequent steel lining was installed?

COYNE: To furnish a cover for the section of the roof above the spring line?

McCARRON: Did you consider in figuring your bid that Items 11 and 12 spell out a certain amount of poundage of steel originally applied to the 50 feet, and would eliminate steel that might necessarily be directed to be installed by the Corps of Engineers as conditions might require?

COYNE: No, it did not eliminate that.

RECROSS EXAMINATION

FOX: Were you directed to install steel liners beyond the 50-foot line?

COYNE: No, we were not. We requested permission to use four ribs.

FOX: When these four ribs were removed, Mr. Coyne, a fall occurred? That is right, isn't it?

COYNE: That is correct.

[fol. 24] FOX: Did a subsequent fall occur at that point at any time later?

COYNE: A small amount.

FOX: Thank you very much, Mr. Coyne.

MIELENZ: When you removed those four ribs, what was approximately the thickness of the rock that fell? How much of a hole did it leave?

COYNE: The slabs that fell out of there varied in thickness, but it was from 1 to 3 feet.

MIELENZ: Over the entire area?

COYNE: For about 16 feet, sir.

FOX: The width of those was what?

COYNE: About 16 inches.

JOHNSON: What weight did you give to Article 4 in preparing your bid? Are you going to file a claim under that?

McCARRON: No, absolutely not. We have done many jobs for the U. S. Engineers, and we are thoroughly familiar with the contract and the articles of the contract.

JOHNSON: What weight did you give to it?

McCARRON: We always knew if there were any changed conditions that due consideration would be given us and we would be reimbursed for anything that we did under changed conditions.

FOX: You did not examine the cores yourself?

COYNE: No.

FOX: You don't know whether Cabot did?

COYNE: No, I do not.

McCARRON: I have a short witness who might clear up this question of the rock. Mr. Richardson, would you be good enough to come down here? Your full name, Mr. Richardson?

DIRECT EXAMINATION

RICHARDSON: Elford H. Richardson.

McCARRON: You live where?

RICHARDSON: Hornell, New York.

[fol. 25] McCARRON: Your business or profession is what?

RICHARDSON: Engineer—Civil Engineer.

McCARRON: And you are connected with the Carlo Bianchi & Company, Inc.?

RICHARDSON: That is correct.

McCARRON: And you have been on this job at Almond Dam?

RICHARDSON: From the start.

McCARRON: What has been your training as a civil engineer?

RICHARDSON: I had about two years' actual working experience while attending Northeastern University. (interrupted)

McCARRON: That is up in Boston?

RICHARDSON: That is correct. Between the years of 1929 and 1934 I worked as an engineer in New Haven, Connecticut, and then worked two years as an engineer for the City of Ansonia. I worked four years in the build-

ing materials business and other shorter term jobs before coming with the Bianchi Company in 1942.

McCARRON: You have been with Bianchi on various jobs since 1942?

RICHARDSON: I have been with them since the first of May, 1942.

McCARRON: I am going to direct my questions to you with reference to this question of the amount of rock that fell in the tunnel. Will you tell the Chairman of the Board and his associates what you know about the amount of rock that fell and when it fell and where it fell.

FOX: Might he use these drawings?

McCARRON: Yes, use the drawings. But first give us what you know verbally and then if you wish use the drawings.

RICHARDSON: The greater portion of the rock that fell following the holing through was in the first month, as Mr. Coyne said. There was, however, considerable rock that fell or was scaled down by the Cabot Construction Company while they were boring the tunnel.

McCARRON: You have in your hand some sheets which are new to me. Will you tell us what they are?

RICHARDSON: These are working sheets to compute the rock overbreak as well as the total amount of rock excavation in the tunnel.

[fol. 26] McCARRON: Are those the records that were kept by you in the regular course of your job an engineer on this particular project?

RICHARDSON: That is correct.

McCARRON: With reference to the fall of rock from portal to portal in the tunnel, we will offer these sheets as exhibits if they will be helpful. Will you tell us if you have them by dates and by amounts of the rock that fell?

RICHARDSON: We haven't it by dates because of the fact that we took the sections during the clean-up process, which was prior to 25 March 1947, and then when the tunnel protection was installed from August until October we took sections as the tunnel protection went in, keeping fairly close to the actual steel erection. We have the actual figures of the difference, or the amount of rock that had fallen in the arch, that is, from the spring line—above the spring line—for the various

monoliths, if you would be interested in that. I think everyone is familiar with the monoliths. For the most part, they are 30-foot sections as the tunnel was concreted. From Station 21+24, which is approximately 75 feet from the inlet end, to 21+54, there were 8.3 yards of fallen rock from the arch. Going down through in 30-foot monoliths, there were 12.2 cubic yards, 8 cubic yards, 6.7 cubic yards, 17.3 cubic yards, 9.4 cubic yards, 3.6 cubic yards, 2 cubic yards, 3.9 cubic yards, 2.7 cubic yards, 3.4 cubic yards, 3.1 cubic yards, 4.2 cubic yards, 3.9 cubic yards, 4.3 cubic yards, and then when we approached the protected area of the outlet end of the tunnel, at Station 26+04, or rather between Station 25+74 and 26+04, we had 16.6 cubic yards. Between Stations 26+04 and 26+34 we had 31 yards and between Stations 26+34 and 26+64 we had 13.3 yards, and then there was a small amount of about 1.4 in the next monolith, and following that we had the steel protection to the end of the tunnel.

McCARRON: Which gives you a total of how many cubic yards?

RICHARDSON: A total in the arch of 163.3 yards. But there was also rock that fell along the sides, which amounted to 19 yards, and sections that had held in place where, in boring the tunnel, the rock had assumed very nearly the desired section of the pay line section. We did have to trim some rock in order to install these liner plates, and that, as best we could measure, amounted to 21.5 yards. That was the amount that was absolutely necessary to trim, but of course in trimming there was probably extra rock that we were not able to measure.

McCARRON: Were you ever in the tunnel, Mr. Richardson, when any rock fell?

RICHARDSON: I have been in the tunnel and heard it fall, but I wasn't near enough to see it fall.

McCARRON: For which you were very grateful, I take it.

[fol. 27] RICHARDSON: That is right.

McCARRON: I have been handed a lot of sheets that do not mean much to me. I don't know engineering, but I think they might mean something to you.

RICHARDSON: These are cross sections of the tunnel taken approximately 10 feet apart going through the entire length, showing the line which the rock assumed when the tunnel was driven, and a dotted line showing the outline of the tunnel as it was just prior to installing the steel ribs between August 1947 and October 1947.

McCARRON: I am going to offer these as exhibits for what assistance they may prove to be to the Board, and if the Board has no objection we will substitute some blue prints for the originals and I shall not attempt to explain them.

FOX: Does the Board feel they will need these in the proper determination of the appeal?

JOHNSON: Mr. Trites can answer that.

TRITES: I think they will be helpful.

MIELENZ: I think we should have them in considering the appeal.

TRITES: May I ask Mr. Richardson just one question about the drawings?

FOX: Yes.

TRITES: Mr. Richardson, is this correct, on this particular cross section the heavy line to which I am pointing in the profile you took after cleaning up?

RICHARDSON: That is correct.

TRITES: And the dotted line represents the profile which you took just prior to erection of the steel protection?

RICHARDSON: That is right.

TRITES: I believe we should take them for reference.

McCARRON: I will arrange to substitute blue prints for the originals. Your witness, Mr. Fox.

CROSS EXAMINATION

FOX: Did these falls consist of small pieces or did they make quite a noise in the tunnel, or were they heavy rocks that crashed down?

RICHARDSON: Well, they were all sizes of rocks. As you can see from the pictures that have been brought in, they were all sizes of rocks—some large slabs and some small pieces.

[fol. 28] FOX: I am sure you must have given the period, but I did not get it. That figure of 163.3 yards of rock fall in the arch, what was that period?

RICHARDSON: I would say a greater portion of this rock fell in the first 30 days following the clean-up between March 25 and April 25 but we were not able to get those sections until we installed the steel ribs in the period between August and October 1947.

MIELENZ: That rock that fell, did it fall naturally or was it caused by the boring of the tunnel?

RICHARDSON: It all fell after completion of the clean-up of the tunnel and no one was in there.

MIELENZ: You were making a final clean-up before starting the concreting work?

RICHARDSON: That is right.

FOX: This has been brought to my attention, will you tell us when the sectional information was taken, for example in solid shown on Sheet 1 of 13, Tunnel Sections taken at Almond Dam," What date was that taken?

RICHARDSON: They were taken at various times. We took them during the tunnel drive and the clean-up of the tunnel. It involved my deciding upon taking them so the Cabot Construction Company could get rock out to the neat line required, and in doing that any rock that may have fallen or come down prior to the initial driving we would get this section.

FOX: So these sections represent information taken between March and August 1947?

RICHARDSON: That is right.

FOX: They are taken from field notes?

RICHARDSON: That is right.

FOX: Subject to the insertion of the actual date those sections were taken, the Government interposes no objection to introducing them as evidence but with the specific qualification that the date be clearly shown on these drawings. This serves no useful purpose to the Board unless you know when this drawing was taken as the Government will show in its presentation of the case. Does the Board direct that taken from field notes that information be placed on those drawings?

MIELENZ: Can the appellant furnish that information?

McCARRON: If we can, we will do so. Can you get that from your tally or log, Mr. Richardson?

[fol. 29] RICHARDSON: We can get it from our field notes. These represent the facts at the time of cleaning up in August.

McCARRON: Subject to that qualification, if Mr. Richardson inserts the field notes as Mr. Fox has requested, we will send the drawings to the Board as an exhibit in the case and if there are any further questions we will endeavor to explain them.

FOX: I have no further questions.

REDIRECT EXAMINATION

McCARRON: Were some of your men in there when rock fell in close proximity to them?

RICHARDSON: Our Chief of Survey Parties, Mr. Burlington (name and title not verified) was in there a number of times during the clean-up to indicate the points they might have decided would have to be further scaled or brought to the right section, and on numerous occasions rock did fall fairly close to the men. In fact, one time during the clean-up a very large slab did drop sufficiently close to Mr. Burlington (name not verified) to splash water on him.

McCARRON: That is all. Thank you.

MIELENZ: The Board has no further questions. We will adjourn for lunch and reconvene at 1:40 p.m.

RECESS

Meeting convened at 1:40 p.m.

MIELENZ: The meeting will please come to order. It is understood that some members of the appellant's party cannot stay over in case we find it necessary to continue this hearing for another day. This Board cannot meet beyond five o'clock due to the fact that certain employees here have to meet certain time arrangements to get stay from this general vicinity. I understand you have to more witnesses.

McCARRON: Two, and a third one that we can probably agree on. His testimony is more or less cumulative of Mr. Coyne's and other testimony given.

MIELENZ: I would like to have the time division on the two witnesses not to exceed one hour in order that as the time approaches five o'clock we can see the progress Government counsel may have sufficient time to present his case, and that as the time approaches five o'clock we can see the progress of the hearing and in order to avoid carrying it over we would permit appellant's counsel to file a brief, if that is agreeable.

McCARRON: That is entirely agreeable and unless Mr. Fox objects I ask that I be permitted to have an opportunity to examine the transcript before submitting the brief. If it is possible for me to have the transcript, I [fol. 30] will proceed as rapidly as possible.

(No objection, and Mr. McCarron was advised he could have transcript.)

DIRECT EXAMINATION

McCARRON: Mr. Diehl, what is your full name?

DIEHL: Everett Diehl.

MIELENZ: I wish to suggest that in connection with identification of witnesses we would rather have their experience statement cut as short as possible in order to get pertinent testimony.

McCARRON: You reside where?

DIEHL: Rosendale, New York (name of city not verified)

McCARRON: Your profession or occupation?

DIEHL: Engineer.

McCARRON: You have been a construction or tunnel engineer how many years?

DIEHL: Thirteen years.

McCARRON: You have worked on various tunnel projects of various types?

DIEHL: That is correct.

McCARRON: In what capacity?

DIEHL: Chief Engineer and Vice President and Engineer in construction of tunnels.

McCARRON: During what periods during the time

you were identified with this type of work were you actually on the job?

DIEHL: From the first part of December, 1946 about the 7th or 8th, I would say, up until the time we put the hole through and cleaned up—about the 1st of April, 1947.

McCARRON: Will you tell the Board in your own words, your own observations with reference to the character of the rock uncovered in connection with the excavation both outside and inside the tunnel, and in chronological order the conversations at which you were present with the Resident Engineer or his assistant in regard to the matter of tunnel protection—whether temporary or permanent?

DIEHL: My first trip to the job was after the start of the excavation in the outlet channel, and I had observed the operation there and saw the character of the rock, and at that time Mr. Dunham, President of the company, and I discussed that we would probably have a little difficulty in the tunnel if the character of the rock [fol. 31] that we encountered in the outlet channel remained the same. I was at that time in charge of a tunnel in Vermont. This was only a visit I made there as an inspection. When the job in Vermont was completed, I took charge of the Almond Dam job. At that time the excavation was nearly completed in the outlet channel, that is, the excavation up to the portal of the tunnel. Subsequently, I had to take out the stilling basin. From that time on—I arrived there the day after the first handing round was drilled under the tunnel—from that day on I was in charge. The rock at the face was very poor for tunnel face as everybody agreed, and we had to sheet it very carefully. I believe we made three fires in the first round and immediately erected our first three rings of steel. We then put some timbers outside the face to protect the portal. Mr. Dunham and I then were rather positive that we were going to run into trouble with the roof, so we went over to see Mr. Coyne and Mr. Bianchi and told them just what we thought, and then went over to see Mr. Mather and Mr. Losey and told them also that we were afraid we were not going to be able to drive that tunnel without tunnel support or protection. It was told us at that time that the only tun-

nel protection that would be provided for the job would be that which had been furnished for the 50 feet in each end. It was suggested that we be prepared to put in some form of temporary protection. We then advanced several more rounds and the character of the rock had no appreciable change, although it looked a little sounder. In other words, we got in from the side of the hill and the layers were a little heavier and the vertical joints and seams weren't as pronounced. Around the first part of January we had another meeting, I believe, with Mr. Mather and we were told at that time again that the only protection that would be provided was that 50 feet at each end.

McCARRON: What was the occasion for this other conference with Mr. Mather?

DIEHL: We wanted to ask him what his opinion was of what our chances would be of driving the tunnel without tunnel protection and he told us he felt the character of the rock would change and become more sound so that tunnel protection would not be necessary. On the strength of that and the experience he said he had had at Arkport, we governed ourselves accordingly and we kept driving tunnel. We completed erection of the 50 feet of steel and drove then three rounds past that 50 feet without any support. At that time, after discussing with my drill boss and the miners, we felt that for our own protection we should get some kind of support in the roof. I then went to see Mr. Bianchi and told him that we were going to have to put something up there and since we had 50 feet of support for the other portal I suggested that we use four bands, which would be eight ribs, and use them which would give an additional 16 feet of support. It was agreeable to him and after an exchange of correspondence with the Army Engineers it was agreed that we could use that as temporary support—temporary protection. We had to guarantee that any damage to the steel would be at our expense.

[fol. 32] McCARRON: In the installation of these four ribs, was anything used to fill the voids between the ribs?

DIEHL: The ribs were put on 4-foot centers. In order to support the roof we had to use timbers. I believe we used old railroad ties and placed them parallel

to the line of the tunnel across the ribs and from that blocked up on to what looked like loose pieces on the roof. We continued driving tunnel and watched the roof very carefully. We made special attempts not to disturb the rock in the immediate vicinity of the arch of the roof because we knew if we did we would have trouble with it. In doing our blasting, we refrained from loading the upper three holes in the line holes of the roof, and laid the holes approximately two feet below that line of holes and broke to the holes that weren't fired. We drilled holes on the line of the tunnel pay line, but did not blast them. Thus we could break the section to the required line with a minimum of disturbance to the rock. That was the method we used, varying the distances between the holes. If the rock looked a little bit better we had to make the distance less than two feet; if it looked worse, we increased the distance. In many instances the rock was hard enough that we had to come back to load holes with a light charge to get the excavation to the right size. We took particular care at all times in going in and out of the tunnel to inspect the roof each way. When we brought the drill carriage in, which was a jumbo made out of a truck, we had two men riding on top of the jumbo with scaling bars and lights and they examined the entire roof. That was the procedure that we followed each day, and if we found unsound rock we scaled it down. By this method we were able to go through without an accident.

McCARRON: At any time was the question of tunnel protection discussed and considered between you and Mr. Mather, and if so, approximately when, and where was it considered as to type, etc.

DIEHL: The only time we made any particular effort to get a decision on tunnel protection was when we first started the job. After we got past that 50 feet we tried to steer clear of any reference to it as long as were able to continue driving tunnel without support of some kind.

McCARRON: Did you have any discussion with Mr. Mather as to under what conditions he would direct the installation of additional tunnel support?

DIEHL: He said that he wouldn't direct the installation of any tunnel protection past the 50-foot limits. That

statement he made before we even started driving tunnel, and when we were in there about 25 feet.

McCARRON: And that is a position he consistently maintained?

DIEHL: That is right.

McCARRON: At any time did you ask the direct question "under what conditions would you direct the installation of permanent tunnel protection?" By that I mean, did he at any time indicate that if certain condi-
[fol. 33] tions occurred, then and only then would he direct permanent tunnel protection?

DIEHL: He made the statement when we pinned him down that the only time tunnel protection would be used would be to prevent the failure of the tunnel itself. In other words, tunnel protection would be used if by using it it would prevent the collapse of the tunnel bore.

McCARRON: Will you tell us, Mr. Diehl, what conditions you observed in the tunnel either during the process of driving the tunnel or during the process of the cleaning up period up to March 25 with reference to the falling of rock?

DIEHL: While we were driving tunnel we did not have any rock falls. We drove it during the cold weather and it may or may not have had something to do with it. We had a considerable amount of mud joints and cracks in the roof. It was where the water was seeping in where we had most trouble. In other words, where the area was wet and water was dripping through the joints in the rock is where we had to keep scaling. The water would work on the clay, acting as a cementing agent, and would wash that out and it would fall by itself. However, after we holed through and came to clean up the tunnel there were considerable rock falls, and fortunately always in back of us. We had one rock fall just at the end of the steel, but that happened when we removed those four ribs that were used as temporary support.

McCARRON: Can you describe the nature and extent of the rock that fell when those four joints were removed?

DIEHL: I would say altogether about five yards of material came out of what 16-foot length. It all came

out of the roof. In other words, when we drove the tunnel we drove it through the required shape, but it peeled back so that the tunnel assumed a rectangular or square shape instead of circular shape.

McCARRON: Can you describe more in detail the character and extent of the falls during the process of the cleaning up and whether you did anything as a result of them?

DIEHL: After we got back maybe 300 feet from the inlet portal, I don't remember what day it was—it was probably the 15, 16 or 17 of March—the roof started to fall in from the inlet back to the outlet back to the inlet and and I went in to see Mr. Coyne. I didn't want to be responsible for cleaning up that bottom again. I went in to see him about it and I told him it was too dangerous to go back and try and clean that up because somebody might get hurt. We kept the clean-up operation going and anything that fell in back of us we left it there.

McCARRON: Was there any appreciable fall back of you after you cleaned up?

DIEHL: Yes, sir.

[fol. 34] McCARRON: Can you give the Board any idea, Mr. Diehl, as to the extent of the rock that fell from the tunnel roof from the time you holed out until you completed the cleaning up operations around the 25th of March?

DIEHL: I would estimate roughly around 50 or 60 yards.

McCARRON: When did you leave the job?

DIEHL: Around the first of April.

McCARRON: When did you return?

DIEHL: I didn't return.

McCARRON: You didn't return to the job? Mr. Diehl, as a tunnel engineer, in the light of the conditions that were found to exist in this tunnel after you had holed out and cleaned up until you left the first of April, do you think you could have put in the concrete lining without some form of protection?

DIEHL: No, sir. I don't expect we could.

McCARRON: What is your distinction between temporary protection and permanent protection?

DIEHL: As defined in the specifications?

McCARRON: Yes.

DIEHL: My interpretation of the specifications is some form of shield that would be used not to protect the tunnel but to protect the workmen. We had discussed, after it became necessary to use temporary protection, what the nature of the temporary protection would be, and one of the suggestions—I don't know who made it—was to rig up some kind of shield on the jumbo to protect the men and have the men work under a shield. When we came to figuring the job, that is what we considered as being required of us in the measure of temporary protection.

McCARRON: You realize that the only reference appearing anywhere in the specifications was protection for the workmen?

DIEHL: That is right.

McCARRON: That would be in the driving of the tunnel?

DIEHL: That is right.

CROSS EXAMINATION

FOX: Mr. Diehl, you had a subcontract with Bianchi?

DIEHL: Yes, sir.

[fol. 35] FOX: What were your requirements as to workmen's safety in your subcontract?

DIEHL: We were to keep the tunnel safe for the workmen.

FOX: Did your contract provisions incorporate by reference the Government contract provisions pertaining to tunnel protection?

DIEHL: I believe they did.

FOX: They did by reference? Do you have that contract with you?

DIEHL: No, sir.

FOX: The Government requirements insofar as the privity of the contract is concerned between the Government and Mr. Bianchi was "Temporary tunnel protection shall be provided where required for safety of the workmen and shall be placed progressively after each heading

blast and prior to resumption of excavation and drilling operations." These are the requirements placed on this contractor. Of course, that portion of the work was subbed out to you. Did your contract provide for reimbursement in the event you had to place tunnel protection in the tunnel proper?

DIEHL: Tunnel protection or temporary protection?

FOX: Temporary protection.

DIEHL: No, we were bound by the Government's contract with Bianchi.

FOX: So this was more or less incorporated by reference?

DIEHL: Yes, sir.

FOX: Outside of the 16 feet support beyond the required protection, did you provide protection in the tunnel?

DIEHL: The only protection we afforded was scaling the roof.

FOX: Were the excavation methods used in this tunnel any different than ordinary construction practice in a tunnel of this nature?

DIEHL: For a tunnel of the size and length, it was standard procedure, yes, sir.

FOX: With this type of material? Was this type of material considered good material to work in?

DIEHL: No, sir. It was good material to excavate but it was bad material to work under.

[fol. 36] FOX: You told the Board members that you would take this jumbo and go into the tunnel every day and you would more or less scale the roof as you went along?

DIEHL: Yes, sir.

FOX: Isn't that generally what you do as a rule?

DIEHL: No. As a rule a safety miner is employed on a tunnel whose job it is to inspect the roof in a tunnel of appreciable size.

FOX: Had you ever tunneled in this area before?

DIEHL: I had, upstate in Ulster County.

FOX: In this same type of rock formation?

DIEHL: It was in shale, but nothing like this. It was more sound shale.

FOX: During the construction period, that is, the boring period, you say no falls occurred?

DIEHL: Just small falls—nothing of any size, just isolated rocks.

FOX: Nothing that would be harmful to a person?

DIEHL: No. I was hit several time by small pieces, and other men were, but any time we saw anything come down during the course of operations we would go back and scale it.

FOX: Isn't it true that under any conditions that would occur?

DIEHL: Yes, sir.

FOX: Wasn't this ordinary falling during tunnel construction? You said you left the job about April of 1947 after the cleaning up process?

DIEHL: Yes, sir.

FOX: You haven't been in the tunnel since?

DIEHL: No.

FOX: Do you know, of your own knowledge, whether any falls have occurred since April 1?

DIEHL: No, sir.

FOX: I have no further questions.

[fol. 37] McCARRON: I have just one or two questions. The temporary type of protection provided had nothing to do with preserving the arch of the roof of the tunnel? It was for the protection of the workmen and contributed nothing to the protection of the tunnel itself?

DIEHL: No, sir.

McCARRON: Mr. Coyne gave a figure which surprised me as to the amount of excavation—2,200 yards. Will you tell us how much was the excavation in this tunnel?

DIEHL: I believe it was in the neighborhood of 6,000 yards. Mr. Coyne said 2,200 yards.

MIELENZ: I would like to ask one question. In regard to holing through and your use of the jumbo, did you provide any protection at the time the drilling was done for the drillers on the jumbo?

DIEHL: Not after we got past the 66 feet of steel.

MIELENZ: They just drilled in there with nothing over their heads?

DIEHL: That is correct. I spent maybe four hours each morning on top of the jumbo myself along with the group, just to make sure the roof was safe.

MIELENZ: How many rounds of holes did you bore in the face?

DIEHL: I believe we used 40 or 42.

MIELENZ: I see. Any further questions?

RICE: I was going to ask Mr. Diehl what he thinks is a reasonable percentage of falling rock in a tunnel of this type. I believe it was brought out that 200 cubic yards was the amount of fallen rock. It figures something like 3% of the amount of excavation. Is that an excessive amount of fallen rock?

DIEHL: I couldn't answer that question because I have never been in a tunnel of this nature that was not supported all the way through. That was the only tunnel in shale I have been in where tunnel roof support was not used.

FOX: Did you have occasion to inspect the core borings, Mr. Diehl?

DIEHL: No.

FOX: Have you seen them since?

DIEHL: No, sir. I didn't examine them.

[fol. 38] FOX: Relative to portal protection, Mr. Diehl, what did you do when you left the tunnel completely holed out? Did you put any canvas at the ends of the tunnel?

DIEHL: No, sir, we didn't.

FOX: You just left it wide open?

DIEHL: Yes, sir. May I qualify that? After we erected the steel at the inlet portal, the Bianchi organization put up a frame and a canvas and covered the inlet.

FOX: Your experience has been mostly in rock tunneling work, hasn't it, Mr. Diehl?

DIEHL: Yes, sir.

FOX: I will show you a picture of what purports to be the tunnel intake showing a canvas in the portal entrance and ask you whether, in your opinion, as a tunnel expert, if air is permitted to go into that tunnel would that have the effect after a month or a year in time tend toward deteriorating the rock formation in the tunnel?

DIEHL: It wouldn't have any more effect in the tunnel than it would have out in the open. I don't believe that was an air-slaking shale.

FOX: You don't think so?

DIEHL: No.

FOX: I believe you told us before that you holed through the tunnel and then you came back and cleaned up. Is that right?

DIEHL: That is right.

FOX: As you were cleaning up, you did hear some rock falls around. Did you go back and clean those up?

DIEHL: We started to until it got too much for us. We didn't believe it was our responsibility.

FOX: So that when you left April 1 you cleaned it out once and then you walked out but there was some rock on the floor of the tunnel left through falls?

DIEHL: Yes, sir.

FOX: Did you make any recommendations to the Bianchi firm as to sealing up this tunnel prior to concreting?

[fol. 39] DIEHL: You mean sealing up the portals?

FOX: Yes.

DIEHL: No, sir.

FOX: What was your opinion as to sealing the portals prior to concreting?

DIEHL: I don't believe it would be necessary in any other place except in air-slaking shale.

FOX: You don't think the entry of air had any effect on this rock formation?

DIEHL: One thing I believe it would have done is to dry out some of the mud in the seams.

FOX: Would that tend to release the rock formation and cause it to fall?

DIEHL: I think the reason was more erosion by water than drying up of the mud seal of the exposed surface.

DIRECT EXAMINATION

McCARRON: Thank you, Mr. Diehl. Mr. Crosby, will you please come up here? Your name is Irving B. Crosby?

CROSBY: Yes, sir, and I live in Cambridge, Massachusetts.

McCARRON: You are a geologist by profession?

CROSBY: And have a consulting office in Boston. I was trained at M.I.T., Harvard and Columbia.

McCARRON: And that has been your sole work?

CROSBY: I have been working in engineering geology since 1920. I was a member of the consulting board on the Garrison, Fort Peck and other dams.

McCARRON: The Government will admit he is an eminent geologist. Coming now to the problem we are discussing, you were consulted by the contractor at the suggestion of Mr. Miles Clair of the Thompson & Lichtner & Company, Inc., about the dam?

CROSBY: It was the latter part of April, about the 28th or 29th of April that I visited Almond Dam and it was just a few days before that they spoke to me about it.

McCARRON: Will you tell the Board, please, Mr. Crosby, what examinations you have made and what studies you have undertaken in order to familiarize yourself with the actual character of the rock that was found in the Almond Dam tunnel?

[fol. 40] CROSBY: I spent two days there. I went in the tunnel several times. The concrete lining was going on, but there was 140 feet unlined near the inlet end and in parts of that the liner plates had been left out or removed so that I could see the rock almost to the crown of the roof. I made a very careful study, particularly studying the fracture system in the rock because I quickly became convinced that that was the cause of the rock falls. Then I made very careful studies outside of the inlet and the stilling basin, and I looked around farther afield in the spillway to see if the geology continued much the same, and made two visits to Arkport Dam to compare conditions there. One was on departure, and on the first day, a special visit.

McCARRON: Did you examine the contract drawings and log readings?

CROSBY: Of which dam?

McCARRON: Almond.

CROSBY: Yes, very carefully.

McCARRON: Did you examine the cores that were available prior to the letting of the bids?

CROSBY: Yes, sir, I examined several of them on Almond but two of them were not available as they had been removed to Baltimore, and I stopped in Baltimore the day before yesterday and examined them there. I believe I have seen all of the cores pertinent to this tunnel—not all in connection with the dam.

McCARRON: Does that complete the substance of the study you made of the rock conditions?

CROSBY: After I returned to Boston I made a very thorough study in the literature of the geology of that part of New York State to fit what I had seen into that in order to understand the nature of the rock at both dams.

McCARRON: Does that substantially complete your study of the situation?

CROSBY: Yes, I think so.

McCARRON: Now, Mr. Crosby, will you tell the Board what your examination of the cores on this tunnel disclosed in relation to or in conjunction with the rocks appearing on the contract drawings? Is there any substantial difference in what you found in the cores from what appears on the contract drawings?

CROSBY: What I found in the cores that were available at Hornell was entirely shale. In the contract drawings there was reference to thin beds of sandstone, but [fol. 41] I didn't see any of that in the cores up there. Cores 13 and 32 that I looked at there are some thin layers of sandy shale an inch or two thick. You couldn't call them exactly sandstone, but they are a little sandy. The core at Drill Hole 13 did show 10 inches of nice sandstone, but it was down below the bottom of the tunnel. There was no sandstone at the level of the tunnel.

McCARRON: Mr. Crosby, will you tell the Board, based on the studies that you made, the information that was made available to you by the men who were on the job, and any other facts, what you can about the character of the rock that actually was found to exist in this tunnel?

CROSBY: The information from studying the cores showed that the rock was shale, but it gave no information about the structure of that rock, and by that I mean the fracturing of it. The rock is intersected by more or less parallel fractures that are two general systems which intersect approximately at right angles, and at the outlet end one of those systems of fractures is practically parallel to the tunnel, and the other is nearly at right angles. In the inlet end they cross diagonally. That fracture is the all-important thing and has caused so much rock fall in this tunnel.

McCARRON: In addition to what you have already told us, did you also have the opportunity to examine an extensive series of photographs taken at this tunnel showing conditions that appeared there?

CROSBY: Yes, sir, I did. I should have had that in my studies, for that was very important.

McCARRON: Why do you place so much emphasis on the fractured condition of the rock and what appeared on the contract drawings as distinguished from what was disclosed to you by the cores, and the contract drawings?

CROSBY: What was disclosed on the contract drawings gave no indication of the fractured condition and that there was going to be so much trouble with falling rock. There was no way of knowing from the information given that the roof conditions would be so bad.

McCARRON: Would the contractor or tunnel engineer have improved or increased his knowledge of the rock that was to be actually encountered in this tunnel had he actually examined the cores?

CROSBY: No, they would have told him nothing about this fractured condition of the rock.

McCARRON: Was there any information shown on the contract drawings which would have warned the contractor of the conditions of the rock in relation to that?

CROSBY: I could not find it after a careful study.

[fol. 42] McCARRON: What sort of information, in your opinion, could have been provided that would have given the contractor or the tunnel driver some informa-

tion as to the character of the rock that was likely to be found?

CROSBY: The best would have been an excavation into the rock at the level of the tunnel. Excavation above or below that would not have been helpful because of the fact that the character of the rock changes quickly.

McCARRON: What is the relationship between this fractured condition or is there a relationship such as you described between the fractured condition and the fall of rock that occurred subsequent to the holing out as described at this hearing?

CROSBY: You mean after the holing out?

McCARRON: Yes, sir.

CROSBY: It was caused by these fractures and the movement of water in these rocks which were unsupported and fell out.

McCARRON: It has been suggested by the nature of Mr. Fox's examination (interrupted)

CROSBY: One thing—you asked what information could have been given. The best other means, you could have had horizontal borings. Such borings were used at Arkport Dam, but not here.

McCARRON: Is that good engineering practice?

CROSBY: Yes, sir, where you want to find out vertical fractures.

McCARRON: It has been suggested, if I understand correctly, that possibly the fact that this tunnel was not sealed after it had been holed through and that perhaps because it remained without anything being done to it from some time in the latter part of March to the beginning of installation of steel liner plates in August, the introduction of air through the tunnel might have been a contributing factor to the falling of rock. Will you give us your opinion?

CROSBY: I think it is insignificant.

McCARRON: Why?

CROSBY: This rock has a slight tendency to air slaking. You can see it out in the open. Little flakes come off and the rock tends to very slowly break down, but it could not cause falling of the rock.

McCARRON: Is it your opinion, based on your study of this particular case, that the falling of the rock that did occur, taking into consideration the amount of rock that fell from March 12, the date of holing out, and the [fol. 43] clean up on March 25, down to the date of installation of liner plates, would have occurred in any event irrespective of whether the portals were sealed or not?

CROSBY: Yes, sir.

McCARRON: Have you made any comparison of pictures taken in April 1947, within a month after cleaning up of the tunnel, and pictures taken the following September, with reference to the fall of rock?

CROSBY: Yes, sir. There were two sets of pictures taken at Station 21+00 and 27+00 for use of comparison.

McCARRON: Would you be good enough to show the members of the Board just the comparison that you make and what is significant about them to you as a geologist?

CROSBY: (Showing pictures to Board members)—Here are the most significant. Station 27+10—here is the one taken on April 25 and one taken on August 26. You can see it is the same blocks of rock, the same profile on the roof. There is practically no change. There are a few farther back, but they are practically the same. Here is another pair—Station 21+00—this, April 25, and this, September 3.

FOX: Under ordinary circumstances wouldn't Cabot clean this out in cleaning the tunnel?

CROSBY: That fell after they cleaned it out.

FOX: Had it fallen before they cleaned it out, they would have cleaned this out, wouldn't they?

CROSBY: I presume so, but this occurred afterwards—this came down afterwards.

FOX: Do you have any pictures showing where nothing fell?

McCARRON: I have a lot of them. We will give you all we have. I have some other pictures here, Mr. Chairman and members of the Board, that I propose to introduce that indicate the stations at which they were taken

and I think show conditions further inside the tunnel. Mr. Crosby, let me ask you, in your opinion, after this tunnel was holed out and in view of the condition of the rock that was encountered as you described it, would you expect that rock would fall from the roof of that tunnel throughout the length and breadth of the tunnel in greater or less degree until permanently supported?

CROSBY: Yes, I would expect there would be some variation in the amount of fall in accordance with the variation of the joint cracks.

[fol. 44] McCARRON: Is there anything significant in the fact that the greatest fall appeared to occur during the first thirty days after the tunnel was holed out and the process of excavating completed.

CROSBY: I believe that was due to the ground water conditions. The frost had come out and there were very heavy rains in April which lubricated these joint cracks and caused the heavy falls at that particular time.

McCARRON: Will you tell us whether or not, in your opinion, the contractor could have lined this tunnel without the use of some form of permanent tunnel support, having in mind the character of the rock, without destruction or damage to the concrete lining?

CROSBY: You mean, could he have lined it without leaving some support in there?

McCARRON: Assuming no support was provided at all, would it have been possible for him to line it with concrete without having falling rock?

CROSBY: I think in some cases they might have gone through the concrete and crashed to the floor which would have left voids in the concrete which would have been exceedingly detrimental to the permanent safety of the tunnel.

McCARRON: Are you familiar with the character of the rock at Arkport?

CROSBY: Yes, I studied it on a visit there this April and I studied it very carefully as shown on the contract plans.

McCARRON: What was the difference between the character of the rock at Arkport and the character of the rock at Almond Dam, some four miles away?

CROSBY: At Arkport it is mostly sandstone with a little shale; at Almond it is entirely shale with a very little sandy shale.

McCARRON: I have no further questions for Mr. Crosby. Does the Board have any?

MIELENZ: No.

McCARRON: I have a series of pictures Mr. Fox has seen. Perhaps you might like to check them over. They are all marked with dates and stations.

FOX: Of what are they indicative?

McCARRON: They are indicative of conditions at the time the pictures were taken. I would like to ask this—are these pictures to be submitted as evidence? I would like to have them marked as separate exhibits or however the Board cares to handle them.

RICE: Is the record clear as to the April Mr. Crosby went to the site?

McCARRON: It was in April of this year.

[fol. 45] RICE: Previously he had made no examination?

McCARRON: None at all.

FOX: If it is agreeable, I would like to put the notation "Mr. Crosby" on the back to indicate that these are the pictures he is talking about. Does that conclude your presentation, Mr. McCarron?

McCARRON: Yes.

DIRECT EXAMINATION

FOX: I would like to call Mr. Congleton. Will you give us your name and present position, please?

CONGLETON: David C. Congleton, Chief, Dam Design Section, Baltimore District.

FOX: How long have you been connected with the Baltimore District?

CONGLETON: I have been with the Baltimore District since November 1946. Previous to that time I was with the Syracuse District and I worked there since 1939.

FOX: Are you familiar with the design of the Almond Dam tunnel?

CONGLETON: Yes, sir.

FOX: I show you page 24 of the contract drawings entitled "Tunnel Sections" and ask you whether or not this pertains to the Almond Dam design.

CONGLETON: Yes, sir.

FOX: Will you tell us in your own way about this particular tunnel—why it was designed that way and from a construction angle how it was proposed it should be constructed?

CONGLETON: This Almond Dam is a flood control structure and the tunnel regulates the elevation of the water in the control pool and during normal low flows the water goes through and after a flood, if the water has been impounded to a relatively high level behind the dam the water is then regulated by gates to flow out of the reservoir through the tunnel in a reasonable length of time, and that is really what determines the size of the tunnel, and in this case we decided a tunnel about 13 feet in diameter, horseshoe shape, would be sufficient to draw down the reservoir pool in a matter of four or five days. Having determined the size of the tunnel, we made a geological investigation of the site selected and found the conditions were conducive and favorable for the construction of the tunnel on the left abutment where we had solid rock with relatively light overburden of earth. The borings in that section were made at both the portals and along the approximate line of the tunnel to check our geological investigations further, and the site was then accurately drawn. The rock was determined to be of sufficient character that it would practically stand and put very little pressure on the tunnel except at the ends at both approaches. You often fracture and seri- [fol. 46] ously damage the rock in your entrances, and there is some danger of a rock slide or serious cave-in developing at portals in which case we trim the portals separately from your main section of tunnel. In our design we assumed rock failure at each end and designed an especially heavy section of the tunnel for each end, but in the center we assumed the rock would stand without any serious slips of any kind, but we did design it for a 10-foot overbreak or fall of rock over the crest of

the tunnel. We allowed for hydrostatic pressure. In order to uphold the portal and prevent any serious movements, we designed a very heavy rib protection for 50 feet at each end. We figured the tunnel would be excavated from both ends simultaneously, drilling at one end and mucking out at the other, and then switch crews. It could be done from either end or just one end as specified. After we got into the mid-section, so far as the design of the tunnel was concerned, we had no interest in the protection because we could see no possibility of rock slide or any serious pressures exceeding our assumptions coming in the main section of the tunnel. In order to expedite the work and maybe let the contractor use his own initiative, we did not specify any particular type of protection in the section in the center, leaving that up to his own devising and ingenuity. The different methods —most every contractor has his own for handling those things and so far as the design goes, we were disinterested. Of course, we have grouting, too. In case of overbreaks it would be filled in with concrete and all cracks were to be grouted up with grouting and it makes a solid tunnel all the way through. That is about all on the design.

FOX: Will you explain to the Board what procedure the designer expected to be used in constructing this tunnel?

CONGLETON: We assumed a normal procedure—the one used. We had presumed it would be used—tunneling entirely from one end or tunneling from both ends. We assumed they would go in and start setting their portals with heavy beams, getting a nice line, and get lined up within 50 feet, after which he would proceed with tunneling and provide any necessary safety protection immediately. In most cases they provide it right away rather than waiting until the rock has fallen in. They keep it well protected as they work.

FOX: Will you, as an engineer, give us from a practical standpoint how would a man construct this tunnel actually? Will you go through the blasting procedure?

CONGLETON: That was very well described by Mr. Diehl. You would get an opening ahead of 10 or 15 feet.

Then you determine the pattern of 25 or 30 holes, whatever you use. Then the holes are drilled near the pay line to relieve the rock pressure on the side. Standard procedure is used from then on.

[fol. 47] FOX: Will you give us the dimensions of the tunnel, the tunnel lining, neat lines, and pay lines?

CONGLETON: The inside was horseshoe shape, diameter of 13 feet. In the main section we had 1 foot three inches of concrete. That is the thickness to this jagged line. We didn't expect any neat breakage in there. When clean we had a one foot three line. On the end sections we have a different design. We have a one foot six section with reinforcing in the ends, and the reinforcing is sufficient to take care of any load occuring on the ends without using in any way the protection work, the ribs and plates.

FOX: Why is it, from a design standpoint, that tunnel protection was required at the first 50 feet inlet and outlet ends, and not in the center of the tunnel?

CONGLETON: The first 50 feet are subject to a great deal of strains that you don't get on the inner surfaces. Any kind of crack can cause a slide and you could get a break clear up, even up to the surface, maybe a 25-foot break, and the entire roof fall in on you. In the inside if it breaks at all, the tunnel roof breaks into a triangular section and you get corbelling over, just like you get an arch for a bridge. The roof will eventually arch itself over in natural shape, so there would be no possibility of breaking.

FOX: Prior to designing this tunnel in the manner you did, did you have occasion to study the core borings?

CONGLETON: I, myself, only studied the logs of the borings. I never saw the borings.

FOX: Are the end sections of the tunnel different in any other way from the center of the tunnel?

CONGLETON: The end sections are designed for a different load and are thicker and sufficiently reinforced with steel to withstand a much heavier load than the center section.

FOX: Mr. McCarron, your witness.

McCARRON: I understand you are a designing engineer associated with the Corps of Army Engineers. You are the man primarily responsible for the design of this particular tunnel?

CONGLETON: I would not say I was the original designer. Al Parnell was on the general design and was thoroughly familiar with it at the time, but I am now thoroughly familiar with it.

McCARRON: Did you participate in the design of the Arkport Dam?

[fol. 48] CONGLETON: Yes, sir.

McCARRON: The Arkport Dam, were you ever in that?

CONGLETON: The only thing I did at Arkport—I came to Binghamton District in 1939 and started immediately working on the change order. The job was under construction at that time.

McCARRON: As you told Mr. Fox, you didn't examine the cores but you did study the log readings on the drawings based presumably on the cores?

CONGLETON: Yes, sir.

McCARRON: And that, for your purpose as a designing engineer, you felt was sufficient, is that right?

CONGLETON: I had the advice of our district geologist, Mr. A. E. Wood.

McCARRON: Of Amhurst now?

CONGLETON: Yes, sir.

McCARRON: Combined with the advise of Mr. A. E. Wood, that was sufficient for your purposes to determine it, is that correct?

CONGLETON: And numerous consulting meetings in addition.

McCARRON: With all those factors taken into consideration did you consider that sufficient information to determine reasonably what the character of the rock was expected to be?

CONGLETON: Yes, sir.

McCARRON: And as has been stated here, no rock was exposed at the site of this job at the level of the tunnel, was there?

CONGLETON: I haven't followed that stream along there. I couldn't say.

McCARRON: And the log readings give no indication of any fractures in the rock? Or perhaps you would prefer not to give the answer.

CONGLETON: I would prefer not to give the answer.

McCARRON: Let us go back to the tunnel protection. Have you ever been in the Almond tunnel?

CONGLETON: Yes, sir.

McCARRON: When?

CONGLETON: I was in there twice. One time they had it lined all the way through—it must have been about three months ago.

[fol. 49] McCARRON: Prior to three months ago, had you ever been in the tunnel?

CONGLETON: Yes, sir, I was there very early in the game.

McCARRON: About when?

CONGLETON: I would say I was in the portal about February, 1947, or something like that.

McCARRON: Did anybody accompany you at the time?

CONGLETON: I would have to figure.

McCARRON: Colonel Samples with you?

CONGLETON: No, sir. I don't recall who.

McCARRON: Up until it had been completely lined, you didn't have any occasion to go, up until about three months ago?

CONGLETON: No, sir.

McCARRON: Prior to testifying here today, have you consulted with Mr. Mather and Mr. Losey as to their knowledge of what developed during the course of the job as to the rock in the tunnel?

CONGLETON: Yes, sir.

McCARRON: By the way, are you in some measure responsible for the writing of the specifications on this job?

CONGLETON: Yes, sir, but I am not primarily responsible for them. I reviewed the specifications.

McCARRON: But you are sufficiently familiar with them to know that the only reference to temporary pro-

tection appearing in those specifications relates to the matter of protection of workmen?

CONGLETON: Yes, sir.

McCARRON: And you do know that on the matter of tunnel protection as such the contract specifications provide 50 feet at either end, and as directed?

CONGLETON: Yes, sir.

McCARRON: Have you seen Engineers' Exhibit L in this case which was the contracting officer's denial of the claim of the contractor?

CONGLETON: Yes, sir.

[fol. 50] McCARRON: And you are familiar with the fact that one of the grounds upon which the claim was denied, specifically ground No. 5, states:

> "Paragraphs TP 4-03(a) and (c) of the specifications also describes and indicates the limits of tunnel protection 'as required for distances of approximately 50 feet at each end of the tunnel.'"

And the contracting officer goes on to say:

> "This limitation to hold unless otherwise directed."

Is that correct?

CONGLETON: I don't remember.

McCARRON: The letter is dated 5 May 1947. Paragraph *e* is the one I am referring to.

CONGLETON: That is right, yes, sir.

McCARRON: So that at least there was in the minds of the contracting officer and presumably the Resident Engineer and presumably the officials of the Corps who were responsible for these specifications that conditions might develop in the course of the progress of this job that might require further tunnel protection?

FOX: I object. Mr. McCarron is presuming that the witness can testify as to what was in the minds of eight people.

McCARRON: All right. You have told us about the provision of 50 feet that you figured that the rest of the tunnel would be of such character that tunnel protection would probably not be necessary. Right?

CONGLETON: Right.

McCARRON: But you did have in mind, based on your experience as a designing engineer, particularly in tunnels, that it might possibly produce conditions where further tunnel protection might be required, and that would be the reason for that phrase?

CONGLETON: We often run across a bad crack (interrupted)

McCARRON: Isn't it a fact that so far as the drawings and specifications are concerned, predicated on your knowledge of tunnel construction, that there might arise a circumstance of conditions unearthed when you dug the tunnel different from what you might reasonably have expected, so you put in the safeguard for further tunnel protection "as directed"?

[fol. 51] CONGLETON: Yes, sir, it is in there.

JOHNSON: I believe the specification speaks for itself.

McCARRON: I am just inquiring. Can I assume that that is the purpose of that—those circumstances?

JOHNSON: Yes, sir.

McCARRON: Now, Mr. Congleton, the provisions that we have referred to with reference to the 50 feet, and as directed, and the provisions for temporary support for the protection of workmen are the only provisions that you know of relating to tunnel protection in any form—or protection in any form?

CONGLETON: The 50 feet as required for protection of workmen.

McCARRON: There is nothing in these specifications that expressly provides that which you have suggested in your direct testimony that on the question of tunnel protection the contractor would protect himself as the work proceeded, is there?

CONGLETON: I believe it says that he shall set his temporary lining after each blast. Yes.

McCARRON: In which case he would have his men protected as he proceeded.

CONGLETON: That is for protection of workmen.

McCARRON: You understand, of course, that the provisions of the specifications show that concrete lining is not to be installed until after the tunnel has been holed out?

CONGLETON: I cannot say for sure, but it is my impression that that is correct.

McCARRON: Now, the determination that the rock would be able to stand with very little pressure on top was as a result of the core borings which were translated into the logging on the contract drawings and the consultations had between you and your colleagues at the Engineer Office?

CONGLETON: Yes, and the Chief of Engineers Office and consultant engineers.

McCARRON: And when you made the statement to the Board that you had no interest in protection in the mid-section of the tunnel, that was because you assumed that the conditions in the mid-section of the tunnel would be such that the tunnel itself would be self-supporting?

CONGLETON: We assumed a full hydrostatic load of 1,000 pounds per square foot and a rock load over the entire tunnel, 17 feet wide by 10 feet high, which would be for each foot of tunnel. We could stand a fall of 10 x 15 divided by 27, or about 5 yards per lineal foot. The tunnel would still stand nicely before it was grouted. After it was grouted you would have a mass that would be completely stable.

[fol. 52] McCARRON: That was the assumption you made in connection with the tunnel?

CONGLETON: Yes, sir.

McCARRON: You assumed that the roof would be supported without the necessity for any type of tunnel protection as distinguished from protection for workmen?

CONGLETON: Yes, sir, that the concrete would do it.

McCARRON: I think that is all, Mr. Congleton.

FOX: Does the Board have any questions to ask?

MIELENZ: None for the Board.

DIRECT EXAMINATION

FOX: Mr. McGavock, will you come up here, please. Will you state your name and occupation for the record?

McGAVOCK: C. B. McGavock, Jr., Geologist with the Baltimore District.

FOX: How long have you been connected with the Baltimore Office?

McGAVOCK: Since April 8, 1947.

FOX: Are you a college graduate?

McGAVOCK: Yes. I graduated with my Master's degree in 1935.

FOX: Since that time what has been your occupation on an overall basis?

McGAVOCK: I was geologist with T.V.A. from 1935 to 1943. I also worked on considerable tunneling in which we had 40-foot tunnels, on at Wautauga and at South Holston, both in Southern Tennessee. I was on both tunnels.

FOX: During your employment with the District Engineer of the Corps of Engineers, did you have occasion to inspect the Almond Dam?

McGAVOCK: I have inspected it a number of times, the first being on June 24, 1947.

FOX: On June 24 ,1947. On that date had the tunnel been bored through?

McGAVOCK: It had been holed through for some time. There was quite a bit of water and it had to be pumped out before I could get in.

FOX: And on that date also I believe the liner plates had been placed in the tunnel?

[fol. 53] McGAVOCK: There had been no protection work done. The rock was exposed throughout the tunnel.

FOX: May it please the Board, and to refresh your memory, this was a period in which the tunnel had been bored but no protection had yet been placed by the contractor. On March 11, 1947, we have the Cabot firm walking out after completing its job. In August the Bianchi firm coming in and placing the temporary protection. It is between this period that this witness actually inspected the tunnel. Will you tell the Board the result of your inspection of the tunnel on that date?

McGAVOCK: I went in the upstream end of the tunnel with a very good flashlight and walked most of the distance through it down toward the downstream portal where the water was deep. I observed the sedimentary shale rock and the rock falls that had taken place. These were concentrated in three areas where the typical normal joints that you expect to find in flat

bedded sedimentary rocks cross each other and had been weathered to the extent that there was sufficient clay to lubricate some of the contact planes and prevent a good bond. The main one was in the downstream portal area at Stations 26+67 to 27+06, and there was one area near the bend in the tunnel more or less concentrated in the outer limits of the upstream portal. I also observed that there was considerable slaking of the shale rock, which is more or less to be expected in an aluminum silicate type of rock. The dessication of the air and change in temperature to perhaps below freezing in March and the rise in June to 90 or 95 degrees causes expansion of the rock and results in a certain amount of movement which would tend to free the bedding planes and allow some falls to occur.

FOX: As a result of that inspection, did you have occasion to prepare a report to the Chief of the Construction Division of the Baltimore office?

McGAVOCK: I prepared a report on the 7th of July, stating my opinions for the condition of the tunnel.

FOX: May it please the Board. At this time I would like to have the author of this report read it into the record. While it is part of your record, it does contain information which possibly counsel for the appellant might want to cross-examine this witness on. Will you please read your report of 7 July on the condition of the Almond Dam.

McGAVOCK: "On 24 June 1947 the portals and upstream half of the Almond Tunnel were inspected for falling rock conditions. The downstream tunnel end was not inspected because of the depth of water present.

[fol. 54] "Bedrock is thin bedded, hard gray sandstone varying from a few inches to 1½ feet thick with inter-spaced partings and zones of black, fissile shale. The beds lie essentially flat except near the upstream entrance to the approach channel where, for a few feet, they have been broken and contorted by the pressure of the glacier.

"Overburden in the approach channel and stilling basin is shallow and is till mixed with bedrock fragments. It stands very well.

'In the upstream portal cut, rock fragments of very small size are continually sealing off the walls and small cones have built up along the edge of the water. No conspicuous joints were seen in this area.

"In the stilling basin, two vertical joints striking nearly parallel with the cut have caused overbreakage along the left wall, some of it having occurred since activity was suspended, as broken rock may be seen at the foot of the cut. A third joint entering the tunnel over the downstream portal caused a fall about 3½ feet deep, the deepest overbreakage seen anywhere in the tunnel. This has been backfilled with broken rock over the metal liner and has been stable since. In the open cut occasional tiny fragments may be heard falling.

"In both the upstream and downstream cuts, one or two scalings during construction, with particular attention paid to removing overhangs and unattached rock along the joint faces, should establish a permanent surface. Small fragments will continue to fall due to slaking of the shale, but it is not believed this will be enough to undermine the more resistant sandstone beds and cause them to fall.

"Inside the tunnel, which is now closed off from outside dry, variable temperature air by canvas covers, the rock surface is damp, with occasional dripping areas. The air inside is damp and cool. No fragments were heard falling in an hour and a half inside the tunnel.

"Several long, curving, irregular joints may be seen in the tunnel roof. They are stained by weathering and may carry a small amount of clay. The two conspicuous rock falls, where slabs of sandstone lay on the tunnel floor and where overbreakage, probably less than 2 feet deep could be seen, occurred where pairs of these joints cross each other at sharp angles.

"It is believed the falls resulted in the joint-weakened rock, when air of different and varying tem-
[fol. 55] perature and humidity caused contraction and expansion of the shale interbedded with the sand-

stone. No falls occurred during the driving of the tunnel, but only after holing through when the ends of the tunnel were left open and the rock exposed to exterior variations.

"The tunnel will have to be rescaled. Short lengths of temporary protection are advisable in areas of past falls or where similar joints cross each other. Continuous permanent protection is not necessary.

"If the rock in the tunnel had been protected against thermal and humidity changes and if concreting had been done soon after completion of driving, present difficulties would not have occurred. The fault lies in constructional delays and failure to understand and appreciate the type of rock."

FOX: Mr. McGavock, will you tell the Board in a general way the type of rock that was encountered in this tunnel?

McGAVOCK: Almond Dam rock is shale of the mechanical sedimentary type. In geological age, it is Devonian but is flat lying and has not been subjected to mountain building stresses. The shale is well compacted but not metamorphosed. It is thin to medium bedded, that is, with beds a few inches to a foot or more in thickness. Sandstone beds are negligible. Normal jointing is present but nowhere closely enough spaced to cause a zone of weakness. At three places joints coated with lubricating clay cross each other. It was at these intersections that rock falls occurred and where local protection was necessary for an accumulative distance of less than 100 feet. Being shale, the Almond rock is naturally subject to volume changes of thermal nature due to cold and hot air, and of dessication nature due to unsaturated air which pulls moisture out of the rock. Measures to prevent this action were inadequate. As a result of being subjected to unnatural conditions to which it was vulnerable, contraction and expansion over several months led to slaking and spalling of the rock surface. Had the tunnel been kept humid and near normal ground temperature, had the rock been coated with a protective material, or had concreting been done on the submitted and approved schedule, no slaking of the rock would have

occurred. Protection was necessary for short distances in the three areas of intersecting joints. It is a characteristic of rock in central New York that it is subject to thermal expansion. They have had considerable experience on riprap on jobs where within a few months or a year the rock has deteriorated to such an extent that it has had to be replaced by some suitable material.

[fol. 56] FOX: How does this rock compare with rock generally for drilling purposes, let us say?

McGAVOCK: It rates along with a class of less consolidated sedimentary rock. All rocks fall naturally into three major divisions. Igneous rocks have solidified by the cooling of molten masses. Those cooled in deep-seated zones are granite and related types; those cooled on or near the earth's surface are lava or basalt. In general, igneous rocks are tough, hard and massive. Metamorphic rocks developed by long-continued, deep-seated pressure and heat upon other rocks. Ingneous types metamorphose to gneiss, sedimentary types to quartzite and marble among many others. Most metamorphic rocks are supercompacted, hard and resistant. Sedimentary rocks result from the consolidation by cementation with silica or calcite or by mineral growth of both mechanical and chemical sediments deposited by still or running water or by wind. Mechanical sediments—gravel, sand and silt —derived by erosion from pre-existing rocks and deposited by settlement, consolidate under pressure into conglomerate, sandstone and shale. Chemical sediments—marls and ocean oozes—derived by solution from other rocks and precipitated by animals or by chemical reactions consolidate into limestone and chert. All mechanical rocks tend to revert to their component sediments by chemical or physical disintegration. The latter, occurring frequently in shale and mudrock, is caused by volume changes. This may be brought about by repeated increase or decrease of temperature from the normal ground temperature of 51°; by release of entrapped moisture into dryer air and by frost action. Continued volume changes result in collapse of that part of the rock subjected to the changes, usually a zone a few inches thick. This thermal-dessication disintegration can be prevented

by maintaining natural conditions through protection against outside air. All rocks are defective in the presence of joints or fractures due to volume changes during formation or due to stresses in the earth's crust. These joints occur in sets which cross each other. They may be widely or closely spaced. In addition to joints, sedimentary rocks are separated into beds by parallel bedding planes—caused by hesitations in original deposition, by change of materials or by concentrations of oriented flattened particles. These, also, may be closely or widely spaced. The bedding planes are weaker than the rock itself but are cemented and pressed together. The beds adhere to each other until disturbed by outside influences. Beds of shale, if unbroken by joints, will arch over distances of several feet. New England rock, for the most part, belongs to the deep-seated massive igneous class and to the resistant metamorphic class in which no preventative steps against deterioration are necessary. Gold, heat, freezing, or drying do not have noticeable effect on them over a period of years.

FOX: Did you have occasion after that date to again inspect that tunnel?

McGAVOCK: I was in the portals about once a month from that time on. From June until August I did not enter the tunnel itself because of the water that would have had to be pumped out. In August and September I examined the tunnel and observed the continual slaking so that after the liner plates had been put in the rock had markedly softened and you could hardly touch a [fol. 57] solid piece of rock along the sides of the tunnel.

FOX: In your report to the District Engineer of July 1947, 9th paragraph, you state: "It is believed the falls resulted in the joint-weakened rock, when air of different and varying temperature and humidity caused contraction and expansion of the shale interbedded with the sandstone." Will you explain that a little further?

McGAVOCK: I have had considerable experience with shale and sandstone that has a certain portion of aluminum clay minerals. It is a characteristic of these minerals that they are subject to various expansions. The foliations in the individual mineral planes themselves create this expansive movement.

FOX: It is your opinion as a geologist that air getting into this rock would tend to disintegrate it in time?

McGAVOCK: Changes in temperature and moisture content brought about by the air, yes.

FOX: Did you notice whether or not the portals of this tunnel were sealed?

McGAVOCK: At the upstream portal there was a framework with some canvas across it and the lower flap was open, and if there had been any wind or any outside air currents it would not have prevented the entrance of air into the tunnel.

FOX: In your report you further stated: "The tunnel will have to be rescaled. Short lengths of temporary protection are advisable in areas of past falls or where similar joints cross each other." Will you tell the Board in how many instances falls occurred?

McGAVOCK: Major falls occured in three zones where these clay-lubricated joints crossed each other. This is where protection should have been provided and would have increased the betterment of the working conditions in the tunnel. At other places there was small scaling. Wherever you get shale you get small fragments breaking off at any changing condition. I did not hear any rock falls while in the tunnel.

FOX: You said major falls occurred in three instances and minor elsewhere. Will you please explain major and minor?

McGAVOCK: That would be a slab of rock several inches in thickness and several feet in lateral dimension. There were masses of rock. In two cases they were piled up on the floor about three or four feet high where they had fallen and leaned up against each other. One of those slabs was 4½ or 5 feet in maximum length.

FOX: On June 24 you notices three major falls in the tunnel?

[fol. 58] McGAVOCK: I think those will be shown in the pictures.

FOX: In your report you also recommended that continuous permanent protection was not necessary. Will you explain that, please?

McGAVOCK: The question had come up of putting continuous lining in the tunnel between the downstream 50 feet and the upstream 50 feet. From my experience in that type of rock I did not consider it necessary. At the time it was put in I did not think it was necessary. These places where clay joints crossed each other and permitted the fall of rock could have been delineated and protected, which length of protection would probably amount to less than 100 feet out of the 710 feet in the tunnel.

FOX: Did you have occasion in the past to look at the cores taken in Almond Dam?

McGAVOCK: I looked at the cores that portray the horizon of the tunnel, in which we were particularly interested—Nos. 13 and 32. I have here my description of the cores which tally, except for personal differences of wording, with the graphic logs shown in the folio. It is a shale rock; there is sandstone in there. The sandstone is in minor quantity, but there is enough sandstone to use sandstone in the logs in this bank.

FOX: In your opinion, aren't the logs as shown on the drawings similar in every major detail with the cores actually taken?

McGAVOCK: I would say yes. They are representative to a very accurate degree.

FOX: In June of 1947, or approximately three months after this hole had been bored, in your opinion could this contractor, with the exception of the three major falls, have gone into this tunnel and successfully lined it with concrete?

McGAVOCK: In my experience, it has been done. I see no reason to doubt it in this case. Outside of those three areas, which could have been delineated and protected, there is no reason why it should not have been possible to concrete it without danger to personnel or structure.

FOX: Are the cores which you saw, which were taken before the contract was awarded, truly representative of the actual conditions as they were encountered?

McGAVOCK: Any small diameter drill cores—these particular ones were 1-1/8 inch in diameter—any small

vertical cores will not intersect vertical joints. It would be a very rare coincidence if they did. However, in this type of rock anyone knows that those vertical joints do exist, and that they would weaken the rock where they [fol. 59] intersected, especially as they were clay lined. It was was not the policy of the Baltimore District to make angle holes into the tunnel area. Since then it has been instituted. They are doing it now.

FOX: Witnesses for this appellant have told this Board and would have them believe that ever since the boring took place there occurred more or less constantly falling of rock throughout the tunnel area. It was not safe for man or beast to get in there. In your opinion, based on your inspection of the tunnel on June 24, was it reasonably safe for a contractor to go in there and do the job without tunnel protection?

McGAVOCK: Without any tunnel protection?

FOX: Other than in the area of the three major falls.

McGAVOCK: In the three major fall areas it would not have been advisable. In the rest of the area with a little advance scaling I don't see why it could not have been concreted without danger to personnel.

FOX: When you have a rock fall does it make noise?

McGAVOCK: In a tunnel of that size a very tiny piece of rock will make almost as much noise as a large piece of rock. To anyone who hasn't worked underground, if you hear a fragment of rock fall, it scares you just as bad as a large piece.

FOX: Is it true it has quite a large echo?

McGAVOCK: Yes.

FOX: It scares you to death?

McGAVOCK: Yes, if you live to hear it. In those three areas it would not have been advisable to go ahead and do the job. In the rest of the tunnel I don't see any objection to it.

FOX: And that area totaled about how many feet?

McGAVOCK: The total of the three areas would sum up to less than 100 feet.

Cross Examination

McCARRON: In that very restricted area, just what kind of tunnel protection would you recommend?

McGAVOCK: I would have recommended steel ribs of the type we used with wooden lagging and metal plates—just enough to keep the rock from working loose.

McCARRON: Before you went out on your initial inspection of 24 June 1947, had you familiarized yourself with the correspondence between the contractor, the Resident Engineer and the contracting officer?

[fol. 60] McGAVOCK: I had read the letter just before the 24th of June.

McCARRON: That is Engineer Exhibit "K", signed by Colonel Seybold?

McGAVOCK: Yes, that would have been right in that period. That would be the letter that instigated my inspection.

McCARRON: You will notice that on the first page the colonel says:

> "It is suggested and recommended to you that adequate temporary protection may be obtained by using I beam ribs of about 3 inches and 6 pound weight spaced 4 to 8 feet apart (depending on the overbreak) with 2" timber lagging. The void area in the arch would then be uniformly packed with shale or bank run gravel in a manner to insure uniform load distribution. Protection of this kind will be adequate to support the falling rock load as well as the material used in back packing. A favorable consideration will be given to a proposal of comparable design."

Did you have that thought of the colonel's in mind when you went there?

McGAVOCK: I had read the letter. I had more of my previous experience in tunnels in mind than I had his letter.

McCARRON: You understand from the testimony that has been given here that there was a considerable amount of rock fall, if the testimony of the appellant's witnesses is to be believed, that occurred between the time of the holing out and the time of the cleaning out of the tunnel between March 12 and March 25?

McGAVOCK: Yes, sir.

McCARRON: You heard Mr. Diehl so testify this afternoon?

McGAVOCK: I heard Mr. Richardson so testify.

McCARRON: Do you want the Board to believe or understand, Mr. McGavock, that the falls that occurred between 12 and 25 March that have been described here during the cleaning up period were due to atmospheric conditions that occurred?

McGAVOCK: I am simply amplifying the conditions that existed in the clay-filled joints. A considerable amount of the small pieces was due to the atmospheric conditions.

McCARRON: Well, to whatever they were due, many falls did occur in the tunnel. There is not much doubt about that.

McGAVOCK: In these three areas, when you have two joints intersecting at an acute angle (interrupted) [fol. 61] McCARRON: Would you expect that within a period of 10 to 13 days the operation of atmospheric conditions would have such an effect as to cause the falling of rock in the size and volume that has been indicated by these pictures?

McGAVOCK: At that time of the year the outside temperatures were certainly below freezing, probably 20 to 25 degrees. The normal ground temperature would be about 50 degrees.

McCARRON: Have you made any attempt to find out what the actual temperatures were in March and April of 1947?

McGAVOCK: I have not.

McCARRON: Have you attempted to secure any information as to the amount of precipitation during that period of time?

McGAVOCK: Only by hearsay; I have not checked the figures.

McCARRON: Did you hear that there was a considerable amount?

McGAVOCK: It was a wet month, yes, sir. The Hobart University Weather Station kept the record of the rainfall at the dam.

McCARRON: What type of protection would you have put in where the rock fell?

McGAVOCK: I would have put in the steel ribs with wooden lagging.

McCARRON: Taking or assuming that the rest of the tunnel didn't require any protection at all?

McGAVOCK: With sealing such as Mr. Diehl discussed it would not require any other protection.

McCARRON: You don't agree that the type of protection suggested by Colonel Seybold in his letter of 13 June, Exhibit "N", based on your own independent observation, was necessary?

McGAVOCK: The only difference is in the backfilling with slabs and gravel. Of course, you cannot get wooden lagging to fit.

McCARRON: You wouldn't expect that type of protection that the colonel suggested to be put in for the full length of the tunnel?

McGAVOCK: Not for the full length of the tunnel. That is my personal opinion.

McCARRON: Mr. McGavock, may I ask you this question? If this rock was of an air-slaking character, why were the walls elevated vertically instead of on a slope? [fol. 62] McGAVOCK: I did not have anything to do with the design of the stilling basin or the tunnel itself. The general practice in that country is to put road cuts on a very steep slope.

McCARRON: That is essentially a matter which relates itself back to the original design?

McGAVOCK: Yes, sir.

McCARRON: Is it fair to say that the cores that you subsequently examined that were taken on this job do not disclose joint cracks?

McGAVOCK: In the cores there were a few inconspicous joints. In the tunnel area they did not penetrate the clay-filled joints.

McCARRON: You say that it was not the practice in the Baltimore Office to make inclined holes for boring, but that since then it has been the practice?

McGAVOCK: Yes, sir.

McCARRON: Did you check to see if they had made inclined holes at Arkport?

McGAVOCK: I did not check. That was completed before I came to the Baltimore District.

McCARRON: We can assume from your testimony and Mr. Crosby's that there is a sharp disagreement of opinion on the effect of temperature changes on rock of this sort?

McGAVOCK: There is a difference of opinion.

McCARRON: I see. Have you examined the pictures, Mr. McGavock, that we had here?

McGAVOCK: A good many of them, yes, sir; probably not all of them.

McCARRON: Without precisely knowing where these rocks are myself, but if it should appear from the pictures that joint cracks and rock failures are shown, particularly joint cracks, at the following stations: 21+95, 22+25, 22+85, 23+55, 23+80, 23+95, 25+14.5, and 21+25, that is over a much broader area than the spots indicated where you saw rock lying on the floor of the tunnel?

McGAVOCK: That covers the center part of the tunnel where there may have been parts of rock fallen. They could have come from scaling. The falls I saw were in the upstream and near the exterior part of the mountain.

McCARRON: It all comes down to this, that in the lining of this tunnel and assuming the accuracy of the testimony that was given here as to these rather immediate falls after the holing out process so that the [fol. 63] Engineers could not go back and clean it up; that in the lining of the tunnel, as you saw it, some form of tunnel protection, such as steel liner plate would be installed, and then an attempt made with the hope of getting by, so to speak, with lining the rest of the tunnel with concrete without any protection.

McGAVOCK: Lining the particular areas with steel ribs and wooden lagging, and scaling carefully in the other areas and keeping that scaling up with the concreting operations would have been a matter of a few hours.

McCARRON: And hope that you could get your forms set up and the concrete not before there was any fall?

McGAVOCK: In the course of the inspection if you ran across joints which might not be conspicuous you might need two ribs in there where the safety of personnel was in question.

McCARRON: In other words, if you started to line, then, at the three points where in your opinion liner plates were necessarily required you might well anticipate running into other conditions where the condition of the rock on close examination would suggest the danger of rock movement that would destroy or damage your concrete before it had a chance to harden and hold the rock?

McGAVOCK: That is to be expected in any type of rock work.

McCARRON: Following your theory for the moment, we could of necessity limit the amount of tunnel protection that would be required to those three spots that you have indicated, but we have got to assume that we might or might not run into other areas in this tunnel in the process of getting ready to line it where protection might be necessary.

McGAVOCK: In small areas where detail inspection indicated it.

McCARRON: Only in small areas. If you install steel liner plates or any other form of tunnel protection of steel ribs, and you are going to leave them in there and concrete in there, can we agree that that is permanent tunnel protection?

McGAVOCK: Not if it is temporary protection to the personnel working in the tunnel.

McCARRON: Assuming that it is there for the purpose of preventing the falling of rock such as was done at the first 50 feet on each end of the tunnel and it is going to stay there for eternity, haven't we agreed that that is permanent rather than temporary protection?

McGAVOCK: The protection it offered to you was temporary. After the concrete was poured it was not made permanent.

[fol. 64] McCARRON: You do agree, of course, that the specifications provided temporary protection only for the protection of workmen?

McGAVOCK: That is right, outside of the two 50-foot entrances.

McCARRON: And you can protect the workmen by various devices; that has nothing to do with leaving anything in the tunnel proper, such as steel ribs, etc.?

McGAVOCK: It is much easier to leave it in there because it is too dangerous to remove it.

McCARRON: If it is a form of temporary protection, it has to be put in back of the neat pay line, which means necessarily that you have to excavate the bore of the tunnel larger.

McGAVOCK: In those immediate vicinities.

McCARRON: In those areas?

McGAVOCK: In those immediate areas, yes, sir.

FOX: Does the Board have any questions?

MIELENZ: In your examination of the tunnel in June of 1947 were there any falls from the roof that caused domes of any appreciable height?

McGAVOCK: Of course I was standing on the floor of the tunnel. It wasn't too easy to estimate the depths of the overbreaks. In one place between two and three feet; not a deep overbreak.

MIELENZ: No appreciably high dome?

McCARRON: How much of the tunnel did you inspect closely?

McGAVOCK: I would say two-thirds of the upper length. When I came to the downstream portal, water was in there.

McCARRON: How much did you miss on a close inspection?

McGAVOCK: Less than 200 feet; that is, outside of the steel that was already placed in there.

McCARRON: In other words, there was water on the outflow end?

McGAVOCK: The lower end, the downstream end, and they pumped all the water from the upstream end, and I waded in there until it got too deep for comfort.

MIELENZ: The only means of illumination was that provided by a flashlight?

[fol. 65] McGAVOCK: Yes, sir. That explains why the tunnel was not visited during this period, because there was no illumination, and the water was in there.

McCARRON: When were you first officially called in to give consideration to this tunnel?

McGAVOCK: About the 20th of June—maybe three or four days before. I came to the Baltimore District on the 8th of April.

McCARRON: So it was around the 20th of June when you got around to this inspection?

McGAVOCK: Yes, sir.

RECESS

MIELENZ: Are you ready, Mr. Fox? If so, the meeting will come to order, please, and we will continue with the hearing.

DIRECT EXAMINATION

FOX: At this time, may it please the Board, I would like to present Mr. Mather, who was the Resident Engineer on this project. For the purpose of the record, will you state your full name?

MATHER: Donald E. Mather.

FOX: And you were the Resident Engineer on this project, Mr. Mather?

MATHER: Yes.

FOX: How long have you been connected with the Government, Mr. Mather?

MATHER: I have been connected with the Government on two different occasions—between 1907 and 1913 and since 1932.

FOX: In that affiliation what was the nature of your position with the Government?

MATHER: Up to 1913 I was out on the Pacific Coast on levee work at the mouth of the Columbia River and also fortification work.

FOX: And you came back into Government work about when?

MATHER: About 1932.

FOX: Since 1932 you have been employed by the Government?

MATHER: Yes, sir.

FOX: In what capacity, Mr. Mather?

[fol. 66] MATHER: Principally as Resident Engineer on Construction work.

FOX: In that position did you have occasion to be Resident Engineer on other jobs similar to this?

MATHER: Yes, one quite similar—Arkport Dam.

FOX: Have you had any experience as Resident Engineer in tunneling matters?

MATHER: Arkport Dam.

FOX: Any others?

MATHER: Not while I was with the Government.

FOX: Well, when you were not with the Government?

MATHER: Yes, sir. I was with a construction company back in 1916-17 down in Kentucky, Floyd County. I was in charge of driving five tunnels through shale rock similar to this.

FOX: When did you report to this job?

MATHER: On June 6, 1946.

FOX: So you were the original Resident Engineer and are still the Resident Engineer today?

MATHER: That is right.

FOX: Coming immediately to the problem at hand, i.e., this tunnel, I call your attention, Mr. Mather, to Government Exhibit "C". In this connection, gentlemen, I would like to take out certain paragraphs to read of some of the letters and perhaps read entire letters so that we may refresh Mr. Mather's memory on certain matters.

MHELENZ: Does the counsel for appellant have copies?

FOX: Yes, sir. This is Exhibit C dated December 18, 1946 addressed to Mr. Mather by Mr. Coyne, who is here today, wherein he refers to a recent discussion "which you have with Mr. Diehl and Mr. Dunham of Cabot Construction Corporation, relative to steel tunnel supports in the tunnel outlet transition. We have a communication from them stating that they agree to replace steel supports damaged by blasting and rejected for that reason. We concur with them in this respect and will replace steel supports so damaged at no additional cost to the Government." Will you give us the background of that letter, Mr. Mather?

MATHER: It was early in the game and we were going under ground and the ground was quite soft. The rock was not solid rock; it had been disturbed and our [fol. 67] specifications called for temporary protection and I was of the opinion that they could continue the permanent protection close enough to the heading to give

them the protection that they would need without damaging the material. That was the reason for that letter.

FOX: Fine. In referring next to Government Exhibit "D", letter dated December 20, 1946, by Mr. Mather addressed to this appellant, Carlo Bianchi & Company, Inc., subject, "Tunnel Protection," wherein reference is made to letter 18 December and states:

> "The agreement made as stated in your letter is satisfactory."

That is, you can use these tunnel supports if you will replace them at no cost to the Government. Right?

MATHER: That is right.

FOX: Then he continues—

> "It is thought that the cause of the difference of opinion in this matter was due to a misunderstanding of the use to which Mr. Dunham of the Cabot Construction Corporation, proposed to put the tunnel supports and to clarify the Government's position, the following references to the specifications are made."

He then cites paragraphs TP4-02 and TP4-03. After that he says:

> "According to the specifications, the two types of tunnel protection are for different purposes as indicated in the specifications. It was not considered feasible by this office to use steel tunnel protection as close to the heading as may be required for the protection of the workmen while excavating and drilling without subject to so using it.
>
> "If, in the use of steel tunnel protection in lieu of temporary protection, any steel members are damaged which delay the work, no additional time will be allowed for such delays."

Will you expand on that, Mr. Mather?

MATHER: That is confirming this conference we had and putting it in writing so there would be no misunderstanding of my position in the matter.

[fol. 68] FOX: We next come to Exhibit "E" dated 10 January addressed to the appellant from Mr. Mather:

> "This letter will serve to confirm the discussion relative to tunnel protection attended by Mr. Peter Bianchi, President of Carlo Bianchi & Co., Inc., Mr. E. Diehl of the Cabot Construction Co., Tunnel Sub-Contractor, and Messrs. D. A. Losey and D. E. Mather of the Government Inspection Force. This conference was held in the Resident Engineer's Office, Thursday afternoon, 9 January 1947.
>
> "At this time it was understood and agreed that as stipulated in Par. TP4-03, Tunnel Protection, *a.* Scope, that the steel tunnel protection as defined in this paragraph, would not be placed beyond the first 50 feet of the outlet end of the tunnel including the transition section, or to approximate station 27+10. That from this station 27+10 to 21-00 approximately, temporary tunnel protection as indicated in Par. TP4-03, Tunnel Excavation, *a.* Scope, is to be used. Mr. E. Diehl's request to use steel ribs and timber lagging for this purpose is in accordance with the specifications, and therefore permissible, provided the outside edge of the steel ribs are set so as not to be inside the outside neat line of the concrete tunnel lining, and as much of the timber lagging is removed just prior to concreting as is consistent with safe working conditions. The expense is to be borne by the contractor. The material used for such temporary protection is optional as long as it furnished adequate protection."

Will you tell this Board what transpired? Tell them what took place at the conference of January 9 pertaining to this project.

MATHER: The contractor had to use four ribs that were bought for the permanent lining in those first 50-foot sections, and put them in as temporary protection. That letter was written with the intent of outlining the Government's position in relation to the use of those as temporary linings so that there would not be an conjecture as to their use as permanent lining beyond the 50-foot limit.

FOX: In answer to that letter, I will refer to appellant's Exhibit A which is a letter dated January 14, 1947, addressed to the Department, attention of Mr. Mather in particular, and signed by Mr. Thomas A. Coyne, Superintendent, Carlo Bianchi and Company, Inc., in which he referred to this letter I have just read:

[fol. 69] "This has reference to your letter of January 9th, 1947.

"For the purpose of explaining our position in regard to the matters discussed during the conference of January 8th we present the following.

"It was clearly understood that the Government intended to adhere to the specifications defining the limits of Tunnel Protection and did not intend to order any protection between stations 27+10 and 21+00, approximately. It was understood by us that this decision was made because the conditions of the rock in the tunnel excavation at the time did not require protection.

"We did not agree however that we would waive our claim to the necessity of any protection other than that furnished at the expense of the contractor as temporary tunnel protection, or that we assumed full responsibility for the tunnel protection between stations 27+10 and 21+00.

"We feel that there is a possibility that Tunnel Protection may be judged necessary in some places, as the character of the rock is so unpredictable that favorable conditions such as existed at the time of the decision, as outlined above, cannot be anticipated exclusively.

"We believe that the definition of Tunnel Protection as described in Paragraph TP4-03 and temporary Tunnel Protection as mentioned in paragraph TP4-02 are subject to further exploration for distinct clarification as to the limits of each."

I don't believe Mr. Mather needs to tell us about that.

McCARRON: It appears that the areas between stations 27+10 and 21+00 are the exact distances and,

correct me if I am wrong, between the extreme inside limits of the 50-feet at the inlet and outlet?

MATHER: Those are approximate.

McCARRON: Approximate?

MATHER: It was within .05 of a foot.

FOX: At that time, Mr. Mather, on January 9, 1947, [fol. 70] when this discussion as to the tunnel protection, this conference pertaining to tunnel protection, was had, how far into the tunnel had the appellant actually gone?

MATHER: The contractor had not gone beyond the 50-foot section.

FOX: So that neither he nor you would know what to expect. Is it a fact that you nor he knew what rock conditions actually existed or what rock would be encountered?

MATHER: On January 9 they were at station 27+14. That is 24 feet beyond the end of the 50-foot permanent lining.

FOX: Beyond the 50-foot permanent lining. So that at that time you had some discussion as to tunnel lining support throughout the length of the tunnel?

MATHER: They were only four feet in.

FOX: I next present Government Exhibit "R". It is a letter addressed to Carlo Bianchi & Company, Inc., by Mr. Mather referring back to letter dated ~~17~~ 20 January 1947:

> "It is noted that your order includes additional plates for steel tunnel protection from Stations 27+10.5 to 27+08.5 and from 21+00.07 to 21+02.07, sections of the tunnel for which no provisions have been made for placing steel tunnel protection.
>
> "The use of ribs supplied by Commercial Shearing & Stamping Co. was approved for a maximum spacing of 4'-0" and not as a specified distance. It is not considered necessary to space the last two ribs 4'-0" apart.
>
> "Approval of shop drawing for spacers was made under the applicable conditions of Par. 80-6, Shop Drawings, of the contract specification.
>
> "Payment will be allowed for the additional 8 inches required beyond the specified stations to

utilize standard dimension products, i.e., payment will be made for steel tunnel protection from 20+50.07 to 21+00.74 and from 27+09.83 to 27+60.50.

"Additional steel tunnel protection installed outside the above limits without authorization from the Corps of Engineers will be made at the contractor's expense."

[fol. 71] Again, another landmark in this series of correspondence where the appellant is warned and told that if he persists in placing this tunnel protection it shall be done at his own expense.

McCARRON: To whom is that question addressed?

FOX: It is a statement, not a question. I next come to a letter dated 10 April 1947, Government Exhibit "I", addressed to Mr. Mather by Mr. Sullivan of Carlo Bianchi & Company, Inc., subject, "Tunnel Protection." At this time Mr. Sullivan says:

"The work involved in excavating the tunnel bore on this job has been completed, and it has been driven through.

"Permanent tunnel protection in the form of steel liner plates and tunnel supports has been installed for distances of 50 ft. at each end of the tunnel.

"The work of concrete lining the tunnel is scheduled for accomplishment early in the 1947 season.

"It is our opinion that, in recognition of the extremely hazardous conditions existing inside this tunnel, immediate consideration should be given to the provision of permanent tunnel protection throughout the entire length of the tunnel.

"Our workmen cannot be expected to carry on under these conditions, which would expose them to the ever-present risk of serious injury or even death from falling rock. It can be expected that they will refuse to enter the tunnel unless and until these hazards are eliminated.

"We suggest, therefore, that we be given immediate authorization to extend this permanent protection of steel supports and liner plates throughout the entire length of the tunnel, with compensation for same

being made to us under the applicable Job Items Nos. 11 and 12."

In answer to that letter there is a letter dated 15 April and Mr. Mather's position is stated through Mr. Losey.

McCARRON: Let me say this that the appellant does not contend that Mr. Mather's continuous position so far as payment for tunnel protection beyond the 50 feet has been anything but consistent. We don't agree with him, but we do agree he has been consistently consistent, at least in stating that we could put it in if we wanted to but he was not going to recommend that we should get paid for it. We do not have any misunderstanding on that score at all.

[fol. 72] FOX: Briefly, that letter of 15 April states:

"The receipt is hereby acknowledged of your letter dated 10 April 1947 relative to tunnel protection.

"My position in regard to your request for extending contract items 11 and 12 (permanent Tunnel Lining) to protect the tunnel bore between Stas. 21+00 and 27+10.5, which is in addition to 50 feet steel lining including the outlet transition stipulated for each end of the tunnel, is the same as stated in my letter to your company dated 10 January 1947, subject: Temporary Tunnel Protection. That letter confirmed the approval at a conference on 9 January 1947, in which Mr. E. F. Diehl, Vice President of the Cabot Construction Co., proposed the use of steel ribs and timber lagging for temporary protection in accordance with Paragraph TP4-02, Tunnel Excavation a. Scope. On 14 January 1947 you were advised orally that your tunnel sub-contractor was using for temporary protection upstream from Sta. 27+10.5, steel ribs purchased for Item 12, and you were advised that their use in temporary protection would be approved provided such use was confirmed in writing. This was done in a letter dated 14 January 1947 signed by Mr. T. A. Coyne. This is evidence of a clear understanding that the section of the tunnel between Stas. 21+00 and 27+10.05, that temporary tunnel protection for the safety of workmen was to

be used in accordance with the applicable specifications.

"The fact that your sub-contractor was able to drive the tunnel through the section in question safely without placing such temporary protection does not in any way relieve you of your responsibility for protection of the work and workmen during the operations required for placing the concrete tunnel lining.

"In reference to the fifth paragraph of your letter as required by the specifications you are responsible for the safety of all workmen on your contract and shall provide during construction at your own expense adequate safety protection for them and the work involved. Therefore, the further procurement and placing of contract items 11 and 12 are not authorized."

Mr. Mather will you go into the preparation of this letter more thoroughly? It has as a background a request dated April 10 wherein they request permission or authorization to extend the permanent tunnel lining. Are you familiar with it?

McCARRON: I think the letter is very clear and does not need any explanation. I don't offer any objection.

[fol. 73] MIELENZ: Is there any point you want to elaborate on in that letter, Mr. Fox?

FOX: I thought I would like to have Mr. Mather tell the Board during the times these problems came up exactly why the letter was written and what his object was. Now, Mr. Mather, we might do it this way—let me ask you some questions. When is the first time the permanent tunnel lining was brought to your attention?

MATHER: About January—early in January but I can't recall the exact date right off.

MIELENZ: 1947?

MATHER: Yes. No, it was in December of 1946, when they started the tunnel.

FOX: At that time you refised to authorize the placing of the permanent tunnel protection?

MATHER: I refused to authorize placing it beyond the prescribed limits.

FOX: As Mr. McCarron has stated, Mr. Mather, throughout the whole job you have not authorized the placing of this tunnel protection beyond the prescribed limits. Is that right?

MATHER: That is right.

FOX: Will you tell this Board in your own words why you did not authorize the placing of the permanent lining protection?

MATHER: My interpretation of the specifications was that it was temporary lining and that it was the responsibility of the contractor to place it for the protection of his workmen and unless there was some condition which arose in the tunnel similar to the conditions at the portals that required the permanent lining, there would not be any of it placed.

FOX: During the construction of this tunnel, Mr. Mather, in your opinion was there ever any need for the placing of permanent tunnel lining protection?

MATHER: No, there was no need for permanent tunnel protection.

FOX: In your opinion, would it have been reasonably safe for this contractor to place the concrete lining without this protection that he did place?

MATHER: No, sir, he required some sort of temporary protection for the protection of his workmen.

FOX: Did he require it throughout the job?

MATHER: I would not go that far. In my opinion, the only time it would be required was where the roof would be in such a condition that it was needed.

[fol. 74] FOX: Did you at any time require the contractor to place the permanent protection in the tunnel lining?

MATHER: You mean in the end sections or between the two end sections?

FOX: Between the 50-foot sections.

MATHER: No, sir, I never did.

FOX: Did you permit this contractor to place this tunnel lining in the tunnel proper?

MATHER: Not without protest. He put three ribs up and I immediately called his attention to it. Four ribs later went up and I called his attention to that.

FOX: Did there come a time when you did actually permit this contractor to place these liner plates and ribs?

MATHER: Yes. At the time this controversy had been turned over to the District for approval and they agreed that the contractor could put the ribs and light liner plates as I suggested in that section of the tunnel.

MIELENZ: They agreed, you say. What sort of an agreement was it? Is it on paper?

MATHER: No, sir. It was under protest under Article 15 that they were to proceed with the work.

FOX: What letter was that?

MATHER: There was no letter to that effect. There is a letter telling them that they can proceed under Article 15.

FOX: Will you find that letter, please?

MATHER: I think it was Colonel Seybold's letter.

McCARRON: It is Exhibit "N" which is a letter dated 13 June and was written after the contracting officer's denial of the claim.

> "In paragraph 3 of your letter, you state that you are of the opinion that the minimum permanent tunnel protection that will meet the requirements of the situation adequately and for which you request approval are the same ribs and liner plates used at the portals. If you desire to use this design of tunnel protection throughout the tunnel length, its use is approved. You are advised, however, that this type of installation is considered as an over design for the
> [fol. 75] purpose required and will be a more costly installation to you than is considered necessary."

He then goes on to suggest the type brought out in my examination of another witness:

> "It is suggested and recommended to you that adequate temporary protection may be obtained by using I beam ribs of about 3 inches and 6 pound weight spaced 4 to 8 feet apart (depending on the overbreak) with 2" timber lagging. The void area in the arch would then be uniformly packed with shale or bank run gravel in a manner to insure a uniform load distribution. Protection of this kind will be

adequate to support the falling rock load as well as the material used in back packing. Favorable consideration will be given to a proposal of comparable design."

FOX: The first contracting officer's decision was dated May 5, 1947, wherein request is denied that the Government bear the expense of placing this protection and was reaffirmed on June 13, 1947. In conclusion, Mr. Mather, will you tell this Board why you withheld permission to place this tunnel protection at Government expense?

MATHER: In my opinion, it was not called for under the specifications. It could not be placed under the specifications unless we found conditions in the area of unstable rock, rock that was similar to what we found at the portals and we did not find anything of that nature.

FOX: Your witness, Mr. McCarron.

CROSS EXAMINATION

McCARRON: I have just a few questions, Mr. Mather. We did have a situation on this job where these four bents were put in beyond the 50-feet which you protested and gave the contractor a proper warning that if the steel was damaged it would have to be replaced and it is a fact that when that steel was removed there was a fall of rock, wasn't there, at that point?

MATHER: That is true.

McCARRON: Did you prepare these specifications, Mr. Mather?

MATHER: I had something to do with them but I did not prepare them.

McCARRON: Did you have something to do with the preparation of the specifications relating to tunnel protection.

MATHER: Yes, I did.

McCARRON: Did you use the specifications that were used on the Arkport Dam as a guide?

[fol. 76] MATHER: No, sir.

McCARRON: Do you recall that Mr. Nicols, who is a foreman with the Cabot Construction Company, had a talk with you while excavating the stilling basin and he

had suggested to you he was somewhat afraid of the character of the rock that might be encountered when they got into the tunnel?

MATHER: Yes, I remember that.

McCARRON: And you told him your were quite satisfied in your own mind that there was nothing to worry about because the rock was of the same character as you experienced at Arkport?

MATHER: I told him it was something similar.

McCARRON: And that was your opinion?

MATHER: That opinion was also based on the fact that I looked over the logs on the bore holes and I prepared a graph that showed that within that area the material was consistently uniform.

McCARRON: And that despite the fact that for whatever reason may have been the basic cause there was a considerable fall of rock in the Almond Dam tunnel?

MATHER: You could expect that there would be some.

McCARRON: Whether it was expected or not, we must agree that quite a bit of rock did fall, at least in certain places.

MATHER: There was some but I would not say there was an unusual amount.

McCARRON: Now, in the preparation of the specifications in the use of the words "temporary protection" you had in mind that form of protection that was so carefully spelled out that would protect the workmen in the progress of their work?

MATHER: That is right.

McCARRON: And any other form of protection such as protection resulting from the installation of liner plates at the portals was of a permanent character intended to support the ground above?

MATHER: Yes, sir.

McCARRON: And your position, as I have said, was consistent from the beginning that you as the Resident Engineer were not going to approve, for payment at [fol. 77] least, the installation of any protection whose purpose primarily was the support of the ground above beyond the 50 feet of the portals?

MATHER: Whic was necessary for the protection of the workmen.

McCARRON: And that you did not intend to approve and never did approve payment for any form of protection whose purpose basically was the protection or support of earth above?

MATHER: I think that is quite evident from the fact that the subcontractor was able to drive through without any form of protection.

McCARRON: The subcontractor was able to drive through that tunnel and did so apparently without any serious injuries to personnel but having driven through whatever the cause may have been, whether it was atmospheric conditions as suggested by Mr. McGavock, whether fractures in the rock as suggested by Mr. Crosby, or what not, it was never your intention to this day to approve payment to the contractor for any form of protection the basic purpose of which was to support the earth above, was it?

MATHER: That is right because we did not run into conditions similar to those at the portals.

McCARRON: In other words, because you did not run into a condition similar to what was found at the portals. Can I ask you this—if, in your opinion, the character of that rock was such that it was reasonably certain the rock was likely to fall so as to make the lining of the tunnel impossible without, at least in part, some form of protection, not for the workmen but for the tunnel roof itself, if in your opinion this condition had existed beyond the 50 feet of the portals would you have approved payment to the contractor?

MATHER: Yes, if the condition had been such as in the portals—in other words, if it wasn't intact rock.

McCARRON: If it wasn't going to stand up by its own nature. Would you say from your wide experience at Almond and Arkport that the character of the rock encountered at Almond was substantially the same as at Arkport?

MATHER: No, there was more sandstone at Arkport. In fact, we had one sandstone which may have been about 16 inches thick at the upper end of the tunnel that spanned the entire tunnel.

McCARRON: At Arkport?

MATHER: Yes.

McCARRON: And that tunnel was lined without any supports at all?

MATHER: There were ribs and wooden lagging but that wooden lagging was taken out ahead of the concreting.

McCARRON: There were ribs at Arkport at the portals?

[fol. 78] MATHER: No, it called for ribs all the way through.

McCARRON: The Arkport job called for ribs all the way through the tunnel?

MATHER: And temporary lagging but no back packing.

McCARRON: There were no similar specifications provided for in the Almond job?

MATHER: That is quite apparent.

McCARRON: But at Arkport the contractor was paid for the temporary supports that were taken out?

MATHER: That is right.

McCARRON: I think that is all.

FOX: Mr. Mather, recalling to mind April or the spring of 1947 when you bored through, did the contractor have equipment on the site ready to concrete the tunnel?

MATHER: He had his tunnel forms. I think they were delivered on May 9.

FOX: What was the first date in your record that the contractor had available on the site all equipment necessary to line the tunnel with concrete?

MATHER: He had his plant set up and ready on August 5, 1947.

McCARRON: And that was after the steel liner plates had been installed?

MATHER: No, that was before that.

McCARRON: Thank you.

FOX: Does the Board have any questions?

RICE: Did I understand you to say you expected to encounter the same kind of rock at the other dam as you did at this one?

MATHER: I did not.

RICE: I was a little confused on that.

MATHER: The sandstone was quite predominant and I was quite surprised to find that much here.

McCARRON: In other words, in the language of a layman, the land was much better at Arkport than it was at Almond.

MATHER: I think so.

MIELENZ: I would like to ask one question. By appellant's counsel you were asked the question whether you would have paid for tunnel protection other than the portal ends if you found conditions of rock similar to [fol. 79] those encountered at the portals.

MATHER: That is right.

MIELENZ: You would have paid that provided the proper procedure had been followed to permit that?

MATHER: That is right, if the conditions had been found.

MIELENZ: You would have recommended that to the District Engineer and gotten his approval.

MATHER: Yes, we would have gone through the right procedure and recommended approval.

MIELENZ: And that would be under the specifications "as directed."

FOX: That covers the Government's presentation. If it is agreeable to the Board, may we submit briefs?

McCARRON: I would prefer that if we are given an opportunity to examine the transcript of the record.

MIELENZ: How do the Board members feel about that?

RICE: It is all right.

JOHNSON: I am agreeable.

MIELENZ: If there is nothing further to present in the way of further witnesses and evidence, the Board will stand adjourned.

[fol. 80] PLAINTIFF'S EXHIBIT #2

DEPARTMENT OF THE ARMY
Office of the Chief of Engineers
Washington

THE CORPS OF ENGINEERS CLAIMS AND APPEALS BOARD

Refer to File No. ENGAC 22

14 December 1948

Carlo Bianchi & Company, Inc.
Framingham, Massachusetts

Re: Engineers C&A Board Appeal No. 14

Gentlemen:

Attached hereto for your information is a certified copy of Decision No. 14 of the Corps of Engineers Claims and Appeals Board relating to your appeal under contract No. W 30-180 eng-397.

You are advised that a certified copy of the decision has been furnished to Mr. Charles A. McCarron, Counsellor at Law, Boston, Massachusetts.

FOR THE CORPS OF ENGINEERS CLAIMS AND APPEALS BOARD:

Sincerely yours,

/s/ June T. Taugher
JUNE T. TAUGHER
Recorder

1 Incl
Cert cy decision

[fol. 81] DEPARTMENT OF THE ARMY
Office of the Chief of Engineers
Washington

BEFORE THE CORPS OF ENGINEERS CLAIMS AND APPEALS BOARD

Eng. C&A Board Decision No. 14

Appeal of

CARLO BIANCHI & COMPANY, INC.

Under Contract No. W 30-180 eng-397

Appellant, Carlo Bianchi & Company, Inc., has submitted an appeal of 29 May 1948 from the decision of the contracting officer dated 5 May 1948, denying its claim for additional compensation in the sum of $9,000 for installing steel liner plates in addition to those required under the terms of the contract to be placed at the portal and outlet portions of a tunnel excavated as an incident to the construction of Almond Dam, New York, under contract No. W 30-180 eng-397.

The contractor, Carlo Bianchi & Company, Inc., on 3 July 1946 entered into the above-numbered contract with the Government for the construction of an earth dam across Canacadea Creek at Almond, New York.

Appellant's appeal arises out of the construction of outlet works in connection with the construction of the dam, consisting of an intake structure and operating house, concrete lined tunnel, stilling basin, and approach and outlet channels. Specifically, appellant claims approximately $9,000 additional compensation under Article 4 of the contract because of changed conditions allegedly encountered in connection with the construction of the tunnel. This sum represents the cost of furnishing and placing of permanent tunnel lining over and above that required by the contract, or in excess of 50 feet of steel lining required to be installed at each end of the tunnel as indicated in the drawings and as determined by the contracting officer. Article 4 of the contract referred to above is quoted as follows:

"ARTICLE 4. *Changed Conditions.*—Should the contractor encounter, or the Government discover, during the progress of the work subsurface and/or latent conditions at the site materially differing from those shown on the drawings or indicated in the specifications or unknown conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inhering in work
[fol. 82] of the character provided for in the plans and specifications, the attention of the contracting officer shall be called immediately to such conditions before they are disturbed. The contracting officer shall thereupon promptly investigate the conditions, and if he finds that they do so materially differ the contract shall with the written approval of the Secretary of War or his duly authorized representative, be modified to provide for any increase or decrease of cost and/or difference in time resulting from such conditions."

Representations with reference to the site, accident prevention and physical data are set forth below.

"GC-3. SITE INVESTIGATION AND REPRESENTATIONS. The Contractor acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river stages, tides or similar physical conditions at the site, the conformation and condition of the ground, the character, *quality and quantity of surface and subsurface materials to be encountered*, the character of equipment and facilities needed preliminary to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this contract. Any failure by the Contractor to acquaint himself with all the available information concerning these conditions will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Government

assumes no responsibility for any understanding or representations made by any of its officers or agents during or prior to the negotiation and execution of this contract, unless (1) such understanding or representations are expressly stated in the contract, and (2) the contract expressly provides that responsibility therefor is assumed by the Government. Representations made but not so expressly stated and for which liability is not expressly assumed by the Government in the contract shall be deemed only for the information of the contractor and the Government will not be liable or responsible therefor." (Underscoring supplied)

"GC-12. ACCIDENT PREVENTION, FIRE PREVENTION, AND SANITATION. The handbook 'Safety Requirements for Excavation - Building - Construction' approved by the Chief of Engineers 16 December 1941, as revised 15 March 1943, (copy of which is on file in the office of the authorized representative of the Contracting Officer on the project), and as may be amended, will govern in the prosecution of the work in accordance with the 'Accident Prevention' article of the contract."

[fol. 83] "SC-7. PHYSICAL DATA. The information and data furnished or referred to below are not intended as representations or warranties but are furnished for information only. It is expressly understood that the Government will not be responsible for the accuracy thereof or for any deduction, interpretation or conclusion drawn therefrom by the Contractor."

Tunnel excavation and tunnel protection are specified in the specifications quoted below:

"TP4-02. TUNNEL EXCAVATION. *a. Scope.* The tunnel bore may be driven from either or both ends by any of the usual methods of tunneling, provided the driving is continuous and progress is consistent with that indicated on the progress schedule. *Temporary tunnel protection shall be provided where required for safety of the workmen and shall be placed pro-*

gressively after each heading blast and prior to resumption of excavation and drilling operations. * * *" (Underscoring supplied)

"TP4-03. TUNNEL PROTECTION. *a. Scope.* Tunnel protection shall be furnished and placed as required for distances of approximately the first 50 feet at each end of the tunnel which includes the underground portion of the outlet transition. * * *

"*b. Steel Tunnel Protection Supports.* Steel arch rib tunnel protection supports shall be erected in the tunnel sections, where tunnel protection is indicated on the drawings or directed by the Contracting Officer and shall be steel I-beams of the size, weight and length, and bent to the shape indicated on the drawings. The maximum center to center spacing shall be as designated. Suitable dowels shall be provided at the invert to maintain foot of ribs in proper position. Tie rods and spreaders shall be installed at the same time ribs are set. Blocking and other timber required for erection shall be furnished by the Contractor. Arch rib splicing, limited to two for each rib, shall develop the full strength of the rib. Steel ribs shall be left in place and embedded in the concrete tunnel lining.

"c. *Steel Liner Plates.* Steel liner plates for tunnel protection shall be placed in the tunnel sections, where such protection material is indicated on the drawings or directed, to furnish coverage for the tunnel roof section above the spring line. * * *"

[fol. 84] "TP4-04. CONCRETE TUNNEL LINING. *a. Scope.* The entire tunnel bore including the outlet transition shall be lined with concrete which shall conform to the applicable requirements of Section X. No tunnel concrete shall be placed prior to the completion of the entire tunnel bore, then its placement shall be expeditiously prosecuted to completion. * * *"

Payment of tunnel protection, that is, placing liner plates and tunnel supports, is provided for under TP4-08 *b.*

"TP4-08. PAYMENT. * * *

"*b. Tunnel Protection.* Payment for all costs of furnishing and placing liner plates, and tunnel supports, including tie rods and pipe spreaders, specified herein or directed by the Contracting Officer, will be made at the applicable contract unit price for 'Steel Liner Plates,' Item No. 11 and 'Steel Tunnel Supports,' Item No. 12. Partial payments will be made according to paragraph TP11-14."

Under the terms of the specifications, appellant was required to drive a tunnel for the outlet works 710 feet in length and approximately 13 feet in diameter. Contractor submitted a progress schedule proposing to start tunneling about 15 October 1946 and to hole out in February of 1947. The schedule contemplated lining the *entire tunnel bore* with concrete soon after the tunnel had been driven. Actually, tunnel excavation was commenced 11 December 1946 and completed 11 March 1947. Lining of the tunnel bore with concrete was not commenced until 17 December 1947, or approximately 10 months after completion of the tunnel excavation.

As indicated above, paragraph TP4-03 of the specifications required installation of permanent tunnel protection for a distance of approximately 50 feet at each end of the tunnel consisting of steel arch ribs and corrugated steel liner plates as indicated on the drawings, including tie rods and spreaders. With the exception of the portals, paragraph TP4-02 of the specifications required that temporary tunnel protection be provided where necessary for the safety of the workmen.

As pointed out above, appellant contends that because of the character of rock encountered, scaling and falling rock made it necessary to install permanent steel lining beyond the limits required and indicated for payment. Appellant urges that the tunnel could not be lined with concrete unless the entire tunnel was protected by permanent steel lining.

[fol. 85] It is a fact that early in December 1946, before the tunnel had been bored possibly 30 feet, appellant's subcontractor on the project requested permission to place permanent tunnel protection throughout the length of the

tunnel. Numerous similar requests, both oral and written, followed which were consistently disapproved by the contracting officer. By letter of 13 June 1947, the contracting officer made a final decision disapproving the contractor's request which is quoted in pertinent part as follows:

"* * *

"Temporary tunnel protection as required under the provisions of paragraph TP4-02 of the contract specifications is temporary in that its only function is to support a falling rock load and prevent injury to your workmen. The greatest load to which it will be subjected will be the dead load of the back packed materials.

"In paragraph 3 of your leter, you state that you are of the opinion that the minimum permanent tunnel protection that will meet the requirements of the situation adequately and for which you request approval are the same ribs and liner plates used at the portals. If you desire to use this design of tunnel protection throughout the tunnel length, its use is approved. *You are advised, however, that this type of installation is considered as an over design for the purpose required and will be a more costly installation to you than is considered necessary.* (Underscoring supplied)

* * * *

"It is to be understood that the contents of this letter are not to be construed as a reversal of my decision to you dated 5 May 1947 to the effect that no payment would be made by the Government for the additional tunnel protection required to complete work under your contract." (Underscoring supplied)

OPINION

Briefly, the question presented before the Board is whether subsurface and/or latent conditions at the site materially differing from those shown on the drawings or indicated in the specifications were encountered neces-

[fol. 86] sitating protection of the entire tunnel with permanent steel liner plates in order to line the tunnel bore with concrete. Much expert testimony was adduced at a hearing accorded appellant concerning the question of falling rock. Expert testimony offered on behalf of the appellant is substantially as follows:

1. The borings taken along the tunnel were vertical and of small diameter and therefore would not show and could not be expected to show vertical joints or fractures.

2. The "rock falls" were caused by water seeping through such vertical joints.

3. The rock was not particularly subject to air slaking.

Testimony presented by expert Government geologists is, in effect, as follows:

1. That the borings as taken did not show, nor could they be expected, except by coincidence, to show vertical joints, and that the nature of the rock was such that vertical joints were bound to exist, which fact should have been known by any tunnel constructor.

2. That major rock falls did occur at vertical joints particularly where two such joints intersected in the roof of the tunnel; that such areas were small in proportion to the tunnel as a whole and would, in effect, represent less than 100 feet of the 600 odd feet under consideration; and that these areas could have been supported with relatively little temporary protection.

3. The rock was subject to some air slaking and was particularly susceptible to disintegration by thermal change, (i.e., shrinking and expanding with changes in temperature which were aggravated by the contractor's failure adequately to close off the ends of the tunnel pending concreting operations.

In addition, report of inspection was made by a Government geologist on 7 July 1947, approximately four months after completion of the tunnel excavation, who submitted the following report:

"1. On 24 June 1947 the portals and upstream half of the Almond Tunnel were inspected for falling
[fol. 87] rock conditions. The downstream tunnel end was not inspected because of the depth of water present.

"2. Bedrock is thin bedded, hard gray sandstone varying from a few inches to 1½ feet thick with interspaced partings and zones of black, fissile shale. The beds lie essentially flat except near the upstream entrance to the approach channel where, for a few feet, they have been broken and contorted by the pressure of the glacier.

"3. Overburden in the approach channel and stilling basin is shallow and is still mixed with bedrock fragments. It stands very well.

"4. In the upstream portal cut, rock fragments of very small size are continually scaling off the walls and small cones have built up along the edge of the water. No conspicuous joints were seen in this area.

"5. In the stilling basin, two vertical joints striking nearly parallel with the cut have caused overbreakage along the left wall, some of it having occurred since activity was suspended, as broken rock may be seen at the foot of the cut. A third joint entering the tunnel over the downstream portal caused a fall about 3½ feet deep, the deepest overbreakage seen anywhere in the tunnel. This has been backfilled with broken rock over the metal liner and has been stable since. In the open cut occasional tiny fragments may be heard falling.

"6. In both the upstream and downstream cuts, one or two scalings during construction, with particular attention paid to removing overhangs and unattached rock along the joint faces, should establish a permanent surface. Small fragments will continue to fall due to slaking of the shale, but it is not believed this will be enough to undermine the more resistant sandstone beds and cause them to fall.

"7. Inside the tunnel, which is now closed off from outside dry, variable temperature air by canvas

covers, the rock surface is damp, with occasional dripping areas. The air inside is damp and cool. No fragments were heard falling in an hour and a half inside the tunnel.

"8. Several long, curved, irregular joints may be [fol. 88] seen in the tunnel roof. They are stained by weathering and may carry a small amount of clay. The two conspicuous rock falls, where slabs of sandstone lay on the tunnel floor and where overbreakage, probably less than two feet deep could be seen, occurred where pairs of these joints cross each other at sharp angles.

"9. It is believed the falls resulted in the joint-weakened rock, when air of different and varying temperature and humidity caused contraction and expansion of the shale interbedded with the sandstone. No falls occurred during the driving of the tunnel, but only after holing through when the ends of the tunnel were left open and the rock exposed to exterior variations.

"10. The tunnel will have to be rescaled. Short lengths of temporary protection are advisable in areas of past falls or where similar joints cross each other. Continuous permanent protection is not necessary.

"11. If the rock in the tunnel had been protected against thermal and humidity changes and if concreting had been done soon after completion of driving, present difficulties would not have occurred. The fault lies in constructional delays and failure to understand and appreciate the type of rock."

Notwithstanding the fact that paragraph TP4-04 of the specifications required appellant to prosecute placement of concrete lining as expeditiously as possible after completion of the tunnel bore (11 March 1947), actual concreting operations were not commenced until 17 December 1947, some nine months later. The record discloses that during this period the rock in the tunnel had not been adequately protected, both portals of the tunnel having been left open or partially open, thereby exposing

the rock to varying exterior temperatures and humidity with consequent deterioration of the rock due to air slaking.

The testimony and records in the case indicate that had proper measures been taken to protect the interior of the tunnel, and if concreting had been started reasonably soon after holing out, the falls of rock and scaling off the walls of the tunnel would not have occurred. The transcript of the testimony shows that approximately 200 cubic yards of fallen rock was removed after 25 March 1947, date of final clean-up of the tunnel, or approximately 3% of the yardage removed which appears not to be excessive. Vertical joints encountered at three locations representing less than 100 feet of tunnel length could [fol. 89] have been supported with relatively little temporary protection. The principal reason advanced by appellant for not prosecuting concrete operations prior to 17 December 1947 was that it was considered dangerous to line the tunnel with concrete without permanent steel liner protection. The record discloses that the tunnel was holed out without incident, gradual deterioration of rock taking place thereafter because of the failure of appellant to commence the concrete lining promptly, and because of failure adequately to protect the interior of the tunnel from air slaking by sealing the portals of the tunnel.

Upon careful consideration of the foregoing and the entire record, it is the opinion of the Board that changed conditions were not encountered under Article 4 of the contract which would relieve the contractor from the responsibility for the cost of placing steel liner supports beyond the limits required and indicated for payment under the terms of the contract. It is the recommendation of the Board that the appeal be denied.

DISPOSITION

Inasmuch as the appellate authority under this contract is vested in the Chief of Engineers, the Corps of Engineers Claims and Appeals Board hereby reports its findings as above stated to the Chief of Engineers.

Date: 9 December 1948

/s/ L. E. Mielenz
L. E. MIELENZ
Colonel, Corps of Engineers
Chairman, Corps of Engineers
Claims and Appeals Board

/s/ F. T. Johnson
F. T. JOHNSON, Member

/s/ Herbert H. Rice
HERBERT L. RICE, Member

[fol. 90]

DECISION OF APPELLATE AUTHORITY

The above findings of fact, conclusions and views of the Corps of Engineers Claims and Appeals Board in the appeal of Carlo Bianchi & Company, Inc., under contract No. W 30-180 eng-397 have been reported to me, the appellate authority named in the contract, and upon review of the record I am in accord therewith. The appeal is denied.

The Recorder of the Board will notify the parties of my action.

Date: 13 December 1948

/s/ R. A. Wheeler
R. A. WHEELER
Lieutenant General
Chief of Engineers

* * * *

I certify that the foregoing is a true copy of the findings of fact, views and decision of the Corps of Engineers Claims and Appeals Board in Engineer C&A Board Appeal No. 14, appeal of Carlo Bianchi & Company, Inc., under contract No. W 30-180 eng-397, and the decision of the Chief of Engineers.

Date: 14 December 1948

/s/ June T. Taugher
JUNE T. TAUGHER
Recorder

[fol. 91] PLAINTIFF'S EXHIBIT #3

DEPARTMENT OF THE ARMY
Office of the Chief of Engineers
Washington

THE CORPS OF ENGINEERS CLAIMS AND APPEALS BOARD

Refer to File No. ENGAC 26

4 January 1949

Carlo Bianchi & Company, Inc.
Framingham, Massachusetts

Re: Engineers C&A Board Appeal No. 14

Gentlemen:

Attached hereto is certified copy of Supplementary Opinion rendered in connection with your appeal under contract No. W 30-180 eng-397.

Copies of the Supplementary Opinion have been furnished to Mr. Charles A. McCarron, Counsellor at Law, Boston, Massachusetts, and to the law firm of King and King, 1620 Eye Street, N. W., Washington, D. C.

FOR THE CORPS OF ENGINEERS CLAIMS AND APPEALS BOARD:

Sincerely yours,

/s/ June T. Taugher
JUNE T. TAUGHER
Recorder

1 Incl
Cert cy Sup. Opinion

[fol. 92] DEPARTMENT OF THE ARMY
Office of the Chief of Engineers
Washington

BEFORE THE CORPS OF ENGINEERS CLAIMS AND APPEALS BOARD

Eng. C&A Board Decision No. 14

Appeal of

CARLO BIANCHI & COMPANY, INC.

Under Contract No. W 30-180 eng-397

SUPPLEMENTARY OPINION

On 9 December 1948 this Board rendered its opinion recommending that appellant's appeal be denied. This action was based on a hearing accorded appellant on 17 June 1948 and appellant's brief submitted 29 October 1948. Counsel for the Government submitted, on 30 November 1948, brief on behalf of the Government. Appellant transmitted reply brief on 9 December 1948. Counsel for appellant contends that consideration was not given to its reply brief and this supplementary opinion is rendered on review of the entire record, including appellant's reply brief. It is the opinion of this Board that no new or additional evidence has been submitted which would warrant modifying the action formerly taken by this Board. It is recommended, therefore, that the decision of 9 December 1948 be reaffirmed.

DISPOSITION

Inasmuch as the appellate authority under this contract is vested in the Chief of Engineers, the Corps of Engi-

neers Claims and Appeals Board hereby reports its views as above stated to the Chief of Engineers.

Date: 3 January 1949

/s/ L. E. Mielenz
L. E. MIELENZ
Colonel, Corps of Engineers
Chairman, Corps of Engineers
Claims and Appeals Board

/s/ F. T. Johnson
F. T. JOHNSON, Member

/s/ Herbert H. Rice
HERBERT H. RICE, Member

[fol. 93]

DECISION OF APPELLATE AUTHORITY

The above supplementary findings of fact, conclusions and views of the Corps of Engineers Claims and Appeals Board in the appeal of Carlo Bianchi & Company, Inc., under contract No. W 30-180 eng-397 have been reported to me, the appellate authority named in the contract, and upon review of the entire record I am in accord therewith. The appeal is denied.

The recorder of the Board will notify the parties of my action.

Date: 4 January 1949

/s/ R. A. Wheeler
R. A. WHEELER
Lieutenant General
Chief of Engineers

* * * *

I certify that the foregoing is a true copy of the supplementary opinion of the Corps of Engineers Claims and Appeals Board in the appeal of Carlo Bianchi & Company, Inc., under contract No. W 30-180 eng-397 and the decision of the Chief of Engineers.

Date: 4 January 1949

/s/ June T. Taugher
JUNE T. TAUGHER
Recorder
Corps of Engineers Claims
and Appeals Board

[fol. 94] PLAINTIFF'S EXHIBIT #71

COPY

SUBSTITUTE INDORSEMENT

BALTIMORE DISTRICT
NABKT

SUBJECT: Transmittal of Findings of Fact and Appeal of Carlo Bianchi and Company, Inc., under Contract No. W-30-180-eng-397 (10 February 1948)

NADVL 1st. Ind.

Office, Division Engineer, North Atlantic Division, NEW YORK 3, N. Y., 17 March 1948

To: The Chief of Enginers, DEPARTMENT OF THE ARMY
ENGAC

1. This appeal, involving approximately $9,000.00, is for the cost of installing steel liner plates for the entire length of a tunnel excavated in connection with the construction of Almond Dam in New York. The contractor contends that this installation is necessary in order to provide adequate protection of the tunnel despite the fact that the specifications provide that "tunnel protection shall be furnished and placed as required for distances of approximately the first 50 feet at each end of the tunnel—".

2. After thorough review of the matter it has been determined that, contrary to the contractor's contention, the additional tunnel lining was not necessary for the safety of the completed structure. While in some locations within the tunnel, temporary liners may have been required for the safety of the workmen during the placement of the permanent concrete lining, that was contractor's responsibility.

3. Accordingly, this office concurs in the recommendation of the District Engineer that the appeal be denied.

R. C. DUNN
Colonel, Corps of Engineers
Division Engineer

2 Incls (in dup)
1. n/c ex 1 cy w/d
2. w/d
3. n/c ex 1 cy w/d
4. w/d

[fol. 95] PLAINTIFF'S EXHIBIT #72

WAR DEPARTMENT
UNITED STATES ENGINEER OFFICE
P. O. Box 1715, Baltimore 3, Md.

ADDRESS REPLY TO
THE DISTRICT ENGINEER

REFER TO FILE NO.
NABET : 10 February 1948

Subject: Transmittal of Findings of Fact and Appeal of Carlo Bianchi and Company, Inc., under Contract No. W-30-180 eng.-397

To: The Chief of Engineers
U. S. Army
Washington 25, D. C.
(Through: Division Engineer, North Atlantic Division)

1. Pursuant to the provisions of O. & R., 7210.15, there is transmitted herewith copy of the appeal of Carlo Bianchi and Company, Inc., under Contract No. W-30-180-eng-397, for construction of Almond Dam, Canacadea Creek, Almond, New York. Copy of the appeal was furnished this office by letter from the Chief of Engineers, dated 5 June 1947, file No. ENGAC, wherein this office was advised that Engineers C & A Board No. 14 has been assigned to this appeal. The appeal is directed to the Secretary of War relative to a decision by the Contracting Officer made under the subject contract.

2. There is also transmitted the Contracting Officer's Findings of Fact relative to the instant appeal. Counsel for the contractor has advised that the contractor's comments on said Findings were forwarded direct to the Corps of Engineers Claims & Appeals Board. A copy of such comments was furnished this office.

3. As required by subparagraph j of O. & R. 7210.15, a conference was held in this office on 27 January 1948, in an effort to resolve the claim. At that time the contractor presented no new arguments or evidence that would alter the Contracting Officer's decision, and he

therefore requested that his claim be forwarded to higher authority for final determination.

4. Supplementary information and the Contracting Officer's recommendation follow:

a. The contractor's comments on the Findings of Fact state that the claim is based on payment for "Tunnel Protection" rather than "Permanent Tunnel Lining". His contention is not disputed.

b. For the first time during the history of this controversy he makes claim that his appeal is also predicated on Article 4, "Changed Conditions". Heretofore, [fol. 96] the contractor has insisted that his claim is predicated on the fact that conditions in the tunnel present a hazardous situation endangering the workmen and that temporary tunnel protection as contemplated by paragraph TP4-02 of the specifications is not feasible and that it is, therefore, necessary to install steel liner plates for the entire length of the tunnel.

The Contracting Officer finds that conditions encountered were not materially different from those shown on Contract Drawing Sheet No. 7. In this connection, there is appended hereto memorandum dated 7 July 1947 (Exhibit AA), to the Chief of the Engineering Division of this office, by the Baltimore District Geologist relative to his inspection of conditions in the tunnel after the bore had been completed.

c. The statement in paragraph numbered 4, of the contractor's comments, that on page 3 of the Findings of Fact those portions of the specifications quoted as "b. *Steel Tunnel Protection Supports.*" and "c. *Steel Liner Plates*" should have been listed as subparagraphs under "TP4-03" of the specifications, is correct.

d. Subsequent to the appeal of the contractor, additional correspondence ensued relative to the same subject, and is forwarded herewith as supplemental to the Findings of Fact.

(1) On 23 June 1947 (Exhibit BB), the contractor responded to the District Engineer's letter of 13 June 1947 (Exhibit N of the Findings of Fact), taking issue with certain statements therein, and stating that he was

of the "opinion that the conditions require an installation at least of such strength as used at the portals." The fact that this section Station 21+00 to 27+10 of the main tunnel bore, had retained its excavated shape except for a number of fallen rocks since completion of the tunnel bore on 26 March 1947 was evidence that shale formations through which this tunnel bore was driven had sufficient strength to resist any existing external earth pressure without permanent protection.

In this connection, on 28 April 1947 the Resident Engineer, Almond Dam Project, wrote the Chief, Construction Division, Baltimore District: "On 24 April 1947 Mr. L. P. Worsell, Assistant Supervisor of the New York State Division of Industrial Safety, Bureau of Mines, Department of Labor, inspected the tunnel and advised this office orally that he would, by letter, notify Carlo Bianchi and Company, Inc. that the tunnel in its present condition without protection was considered unsafe for the performance of any labor operations in it and that for such protection he would recommend light steel ribs [fol. 97] spaced 4 feet apart covered with 2" timber lagging back packed to the extent that would cushion the impact and/or distribute the load of falling or loose rocks. Mr. Worsell earlier in the year (4 February) while inspecting the tunnel in relation to exhaust fumes from equipment engines stated, on his own volition, that the roof of tunnel was in a much safer condition than he had expected to find it, due to the nature of the shale rock encountered. He did not at that time express an opinion that safety protection was or would be necessary. Mr. Worsell also remarked while here last Thursday that it was unfortunate for the contractor that he had not had the foresight to gunite the exposed tunnel roof with cement as the excavation progressed to seal it against air slacking, stating that such a procedure in other tunnels through shale rock had prevented air slacking and resulting falling rocks."

(2) On 25 July 1947 the contractor wrote (Exhibit CC) that he had given further study to the design of tunnel protection and, "As a result of our further study, and that of special consultants, and recognizing the

interests of the Government in the matter of the costs of the work as an extra under our contract, * * *", he requested approval of a scheme which he had concluded to be "the minimum design with which we can safely proceed." It was considered by the Contracting Officer that 50′ of permanent type protection at each end of the tunnel, except for temporary protection for the workmen, was sufficient. It appeared that the contractor's insurance carriers and consultants had advised him to use the same type of protection for the entire length of the tunnel and that the contractor elected to use the heavier type of protection. It was concluded that the contractor was seeking "an extra" and the above referenced letter appears to confirm this conclusion.

Furthermore, it was apparent that the contractor's scheme contained in his letter of 25 July wherein he proposed to use ½" commercial steel liner plates with 4" 13# H section steel ribs did not correspond with his declaration in the letter of 23 June (Exhibit BB) that "the conditions require an installation at least of such strength as used at the portals," since the liner plates and ribs installed at the portals were in fact of greater strength than he proposed to install for the remaining length of the tunnel.

The difference in sizes and weight for the contract items 11 and 12, and the liner plate and steel rib protection which the contractor furnished and installed for Stations 21+00 to 27+10 are as follows:

Material	Regular Protection Directed by the Government and Installed by the Contractor— Items 11 and 12	Additional Protection Installed by the Contractor— Sta. 21+00 to 27+10
Liner Plates	3/16" x 16" x 37-11/16"	1/8" x 16" x 37-11/16"
Steel Ribs	6" H20# x 20′6-11/16"	4" H 13# z 20′3-1/8"

[fol. 98] It appears that the contractor determined that the heavier type tunnel protection of the same design as stipulated in contract plans for the 50′ of tunnel protection as portal and outlet of the tunnel was not necessary and he therefore changed his claim under Article 15 from

regular payment under items 11 and 12 of the contract to a claim for an extra under Article 5 of the contract.

(3) On 11 August 1947 (Exhibit DD), reply was made to the contractor reiterating the Contracting Officer's position, and the contractor was advised that the design suggested by this office was considered adequate and would be approved for use. It was pointed out, however, that since the safety of the workmen is the contractor's responsibility no objection would be made to the plan he proposed to use. The contractor was also advised that the work would be accomplished at his own expense as provided in the contract, unless found otherwise by higher authority.

(4) On 15 August 1947 (Exhibit EE), the contractor replied to the District Engineer, taking exception to the statement that his failure to proceed was resulting in severe inexcusable delays. It should be noted that the tunnel bore was completed on 26 March 1947, and as indicated in his letter of 15 August, the contractor had not yet commenced his concreting operations as required by Paragraph TP4-04 of the specifications. Article 15 of the contract specifically provides that pending settlement of any dispute arising under the contract, "the contractor shall diligently proceed with the work as directed."

(5) It is believed that the contractor's obligation to provide tunnel protection at his own expense with the exception of the 50 feet sections at the portal and outlet is clearly defined in the specifications and indicated on the drawings. His contentions that the conditions in the tunnel were such that the Government is obligated to require the same type of protection throughout the tunnel is not borne out by the facts. Attention is invited to the statement contained in Paragraph 5 of the contractor's letter of the Resident Engineer dated 23 April 1947 (Exhibit "M" of the Findings of Fact), to wit: "In view of the position taken by the Government, the subcontractor was required to proceed with the excavation of the tunnel without the installation of permanent tunnel protection, employing temporary tunnel protection of its own devising in order to afford the necessary protection for its workmen." The tunnel bore was driven by the Cabor Con-

struction Company, the subcontractor. The contractor's statement cited above is misleading because other than for 3 steel ribs taken from Item 12 stock together with timber lagging used for temporary protection, no temporary protection of any kind was used between Stations 21+00 to 27+10 of the tunnel section. These 3 ribs were removed without any replacement when required for the permanent protection in the intake end of the tunnel. The only precaution taken for the safety of tunnel workmen during excavation was sounding and scaling of the tunnel [fol. 99] roof after each heading blast. Since temporary protection was specified for work to be performed under Paragraph TP4-02 of the specifications, it is reasonable to assume that the cost of such temporary protection was included 1 in the contractor's bid price for Item 10, Tunnel Excavation.

(6) In view of the foregoing, it is recommended that the decision of the Contracting Officer be upheld and that the claim for payment as an extra be denied.

7. If the appeal is sustained, the contractor would be entitled to payment from the Appropriation 21x3113 Flood Control, General in the amount of approximately $9,000.00, i.e., if paid similar to payment under items 11 and 12, and would open the possibility for additional claims for overbreak and contingent items throughout the tunnel. This is a continuing contract and funds have not been made available for payment of the instant claim.

J. P. CAMPBELL
Lt. Col., Corps of Engineers
Acting District Engineer
Contracting Office

4 incls.

1. Exhibits AA to EE incl. (in trip)
2. [redacted] of Appeal 5/29/47 (for [redacted])
3. Findings of [redacted] trip.)
4. Copy of Contractor's [redacted]ments (for NAD files)

cy furnished:

Legal Branch, w/cys. of Incls. 1, 3 & 4

[fol. 100] PLAINTIFF'S EXHIBIT #115

December 20, 1948

L. E. Mielenz
Colonel, Corps of Engineers
Chairman, Corps of Engineers
Claims and Appeals Board
Office of the Chief of Engineers
Washington, D. C.

Re: Engineers C&A Board Appeal No. 14

Dear Colonel Mielenz:

I am in receipt today of the Decision of your Board denying the Appeal of Carlo Bianchi and Company, Inc.

I note that the decision of your Board is dated 9 December 1948. In view of the understanding that I had with Attorney Fox, representing the Government, that a period of ten days was allowed for the filing of a Reply Brief after receipt of the Government's Brief, I am somewhat amazed to find that this Decision of your Board was made prior to the receipt by your Board of the Appellant's Reply Brief, which Brief is dated 9 December 1948, four copies of which were mailed to the Recorder of your Board, Air Mail, Special Delivery, on that date, with the specific request that the copies of the Reply Brief be given to the three members of your Board.

The fact that the opinion of your Board was written prior to the receipt of the Reply Brief, which could not have even been read prior to the Decision is established by paragraphs 1 and 3 of the Board's decision, where the Appellant's claim is stated to be only in the amount of $9,000.

The first time the figure of $9,000.00, as the basis of this claim, was ever brought to my attention or to that of the Appellant, was upon receipt of the Government's Brief on December 2, 1948, wherein that figure was set forth. There is absolutely nothing in the record in this case to justify any reference to any such figure of $9,000.00, as I took considerable pains to point out on

pages 1 and 2 of the "Reply Brief", pointing out specifically, that it was agreed by counsel that no figures were to be submitted to your Board but that if the Appeal was sustained, then the matter would then be referred back to the Field for a determination of whatever might be found to be properly due the Appellant.

As a matter of fact, in a discussion with Mr. Fox, prior to the hearing, I told him that the items involved in the claim, if the Appellant prevailed, would be about $125,000.

To assume that a responsible contractor would expend the amount of time, money and energy that has been spent in the prosecution of this Appeal, involving, as it does, expenses of counsel, experts, preparation of exhibits, travel of numerous witnesses to Washington, to say nothing of the time spent in connection with this claim prior to the formal Appeal, in a matter involving about $9,000.00 on a job of the size of the Almond job, seems to me to border a little on the ridiculous.

[fol. 101] May I respectfully request that the Decision of your Board be recalled and reconsidered and that due consideration be given to the Appellant's Reply Brief and the questions therein raised, which are certainly not considered by the Decision of your Board.

May I have the courtesy of a reply to this letter?

Very truly yours,

/s/ Charles A. McCarron
Attorney for
Carlo Bianchi and Company, Inc.

CAM/RP

[fols. 127-248] * * *

[fol. 249] IN THE
UNITED STATES COURT OF CLAIMS

EXCERPTS FROM TRANSCRIPT OF TESTIMONY OF SEPT. 25, 1956

LESLIE F. WORSELL, a witness produced on behalf of the plaintiff, having been first duly sworn by said Commissioner, was examined, and in answer to interrogatories testified as follows:

DIRECT EXAMINATION

BY MR. KNOX:

Q. Mr. Worsell, will you please give your full name and your address?

A. Leslie F. Worsell, 277 Tampa Avenue, Albany, New York.

Q. Will you state your occupation and profession?

A. I am senior mine and tunnel inspector in the Division of Industrial Safety Service, Bureau of Mines, Tunnels, Quarries and Explosives for the State Labor Department in Albany, New York, for the State of New York.

Q. For how long a period of time have you been occupying your present position?

A. Since February 1, 1940.

MR. METZLER: Mr. Commissioner, may I also call your attention to the fact that this witness did not testify before the Appeals Board?

COMMISSIONER DAY: Very well.

BY MR. KNOX:

Q. Mr. Worsell, since your employment with the Bureau of Mines, et cetera, of the State of New York, what has been your experience in connection with tunnel [fol. 250] work and work of like character?

A. Well, I have been inspector on the New York City Board of Water Supply, Tunnel 25 miles. I wasn't there all the while but I supervised the inspectors on the job.

I was on the Brooklyn-Battery Compressed Air Tunnel, New York City. I was on several small tunnels throughout the state, the enlarging of the D&H Railroad tunnel at Tunnel, New York, and the Almond Dam Tunnel, and the tunnel under Lake Ontario for the Niagara-Mohawk Power Company, a 500-foot tunnel under the lake for water intake purposes, and I was also on the diversion tunnel for Downsville Dam for the New York Board of Water Supply. I think that covers most of it.

Q. Mr. Worsell, in connection with your inspections of these various tunnels which you have described, will you state whether or not certain of or how many of these tunnels are in rock?

A. They were all in rock that I worked with except for the Brooklyn-Battery tunnel was partly in silt and partly in rock.

Q. I now hand you Plaintiff's Exhibit No. 37 and ask you to examine this and state whether or not you recognized what is contained thereon?

A. This is an administrative order from the Department of Labor for the contractor to comply with the ad-
[fol. 251] ministrative order in regards to timbering the roof of the Almond Dam Diversion Tunnel. It was written as a result of my inspection on April 25, 1947, which I can recognize by a copy of the order, and it was issued out of my office on April 30th and it is the original order.

Q. Mr. Worsell, you stated that you inspected the Almond Dam Tunnel in April 1947. Would you describe in detail your examination of the tunnel?

A. The tunnel had some water in it and I was accompanied by Mr. Richardson and an engineer from the resident engineer's office. I don't quite recall his name. We went into the tunnel from both ends, but due to the falling rock hitting the water and so on, I wasn't going to endanger myself and anybody else. We only went in a little ways. We didn't go all the way through the tunnel due to the danger of the roof falling. We could hear it drop, drop, drop, and we hugged the ribs. We went in both ends, both the inlet and the outlet portals, and as a result of that inspection I issued these orders after conferring with the resident engineer.

Q. Would you state whether or not from your inspection, and based upon your experience, that the roof of the tunnel was unstable?

A. If it had not been unstable I would not have written the order.

Q. Did you observe fractures of any type in the rock?

[fol. 252] A. Yes, I did. I observed fractures in my previous inspections during the driving of the tunnel also.

Q. Will you explain about your previous inspection?

A. Well, I was quite concerned about it and I had consultation with Mr. Diehl, the engineer in charge of the tunnel driving, and I told him that we had to keep pretty close watch of it and keep the thing well scaled because we didn't want any bad accidents. You see, my particular job was to see towards the safety of the men for the State of New York on any tunnel, mine or quarry project that is under my supervision, and in order to do that they had to keep the tunnel pretty well scaled. As I say, in the winter there wasn't too much dropping down from that. There was some but not enough to cause great concern.

Q. As a result of your investigation in April 1947, you stated that you conferred with the resident engineer.

A. I called on Mr. Mather, I believe it was. I called on him and told him that I was going to issue this order and that there couldn't be anyone enter the tunnel except to rectify the tunnel, to make the tunnel safe, which the order says, permit no one in the tunnel until this timbering which I ordered was done, except men engaged in erecting the same.

I told him that and he didn't quite like it, I think, as I remember now, and he said: "It is going to cost over 50,000 to put that steel in," and I said: "I can't help [fol. 253] help that, we can't endanger lives of the men by not putting something in," and he said: "I might end up in Leavenworth if I authorized this." I remember that statement very well, and he says: "If I authorize this steel I might end up in Leavenworth," and he also made a statement to me which always stuck in my mind all these years. I said: "You knew the condition of rock,

didn't you?" And he says: "Yes, and the contractor should also."

So, evidently he knew the condition even before the tunnel was started.

Q. Mr. Worsell, referring to the exhibit which you have before you, I note that it makes a recommendation as to the type of protection that should be installed. Is that your recommendation?

A. That's my recommendation. Usually in tunnel work unless you put the steel in and you are going to concrete, you can't take the steel out and concrete because you are getting the same thing you had before you put the steel in. And, therefore, my recommendation was steel ribs supporting either two-inch lagging—they have "logging" here, but I meant lagging, or steel plates. That is common procedure before concreting the tunnel.

Q. That would be liner plates?

A. That would be liner plates. Lagging plates and liner plates are the same thing.

[fol. 254] Q. Then, in your experience would you consider that to be permanent protection?

A. Well, it could not be temporary because you can't remove it before you concrete. It would have to be permanent protection.

Q. Would it be embedded in the concrete?

A. Yes, it would. That is the usual practice.

Q. Based on your experience would you believe it to be good engineering practice to have directed such installation?

A. Repeat that, please.

Q. Based upon your experience, would you state whether or not in your opinion it would have been good engineering practice to have directed the installation of that permanent tunnel protection?

A. You mean immediately as you drove the tunnel?

Q. After the tunnel was holed through.

A. Well, it would have been good engineering practice to do it in conjunction with the driving of the tunnel. That is the usual procedure in bad ground.

Q. Even despite that it still would have been good engineering practice if it had been done, would it not?

A. Oh, definitely.

Q. Even after the holing through of the tunnel?

A. Definitely.

MR. KNOX: Mr. Examiner, I would like to offer [fol. 255] this exhibit. I think this exhibit was offered for a very limited purpose before. Mr. Sullivan identified it as having been received. I would like now to offer Plaintiff's Exhibit No. 37, consisting of an order from the Department of Labor of the State of New York.

COMMISSIONER DAY: For all purposes?

MR. KNOX: For all purposes.

MR. METZLER: No objection.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 37 was made a part of this record.)

MR. KNOX: Your witness.

CROSS-EXAMINATION

BY MR. METZLER:

Q. Mr. Worsell, do you have Plaintiff's Exhibit No. 37 before you?

A. Yes.

Q. Mr. Worsell, in your capacity you are not concerned with the design of the tunnels, are you?

A. No, I am not.

Q. You are not concerned with whether or not the tunnels do or do not need support from the standpoint of design?

A. Not from the standpoint of design, no, just from the standpoint of safety.

[fol. 256] Q. Your order was issued solely in connection with the safety of the workmen?

A. Correct.

Q. And you considered the protection which you mentioned in Plaintiff's Exhibit No. 37, the Industrial Commission's order, as necessary for the safety of the workmen in the tunnel?

A. Correct.

Q. And when you talk about a stable roof you mean a roof where workmen might be endangered by working under it; is that correct?

A. Correct.

Q. Now, Mr. Worsell, have you worked in tunnels in soft shale similar to that at the Almond Dam?

A. I don't recall any quite as bad as that one.

Q. Have you worked in tunnels in the southern half of the State of New York?

A. Yes.

Q. Is the rock structure in the southern half of the State of New York largely shale with thin beds of sandstone?

A. Right.

Q. And is that that the type that was at the Almond Dam?

A. Well, that was more oshale than sandstone at the Almond Dam site. The southern part of the state is [fol. 257] usually sandstone. It has nearly the same cleavage and breakage that the Almond Dam has.

Q. In the general area isn't it typical for the rock profile to consist of shale with thin beds of standstone?

A. That is the only tunnel I was ever on in that area. I don't know.

COMMISSIONER DAY: How often were you there?

THE WITNESS: I made only two visits there. I had 21 counties, and our work was so stretched out at the time that I was only able to be there—I don't remember whether it was January or February, and again after they were holed through. I was there only once while they were driving.

BY MR. METZLER:

Q. Did you visit the tunnel in February, 1947?

A. I am not sure whether it was January or February. I cannot state. It was during the driving, but I don't remember which month.

Q. When you visited the tunnel which, if any, representatives of the United States Government did you talk to on the site?

A. The first visit?

Q. Yes.

A. I had no occasion to call on those people because my work was primarily with the tunnel contractor, and unless some question arose I didn't bother the Government.

[fol. 258] Q. Do you recall any conversations with any of the Government representatives on that site?

A. Not at that time.

Q. Do you recall any conversations with Mr. Mather or Mr. Losey on or about February 4, 1947?

A. I do not recall whether I spoke to them or not.

Q. Do you recall telling Mr. Mather or Mr. Losey that the roof of the tunnel was holding very well, in fact much better than you had expected?

A. I can't recall that. I might have, but I don't even remember talking to them at that time.

Q. Would that be truthful if that were your statement?

A. The only reason it would be truthful was because they were doing a very good job of scaling.

Q. Is it customary practice to scale?

A. Oh, definitely, after every job.

Q. There is nothing unusual about that at all, is there?

A. Not about the scaling. It is usually the practice. Sometimes there is some scaling, more than at other times.

Q. It is common practice in tunnels?

A. It is common practice in tunnels.

Q. You refer in Plaintiff's Exhibit No. 37 to the use of timber or steel to control the roof. Was timber a satisfactory material to protect the workmen from the rock falls?

A. This is a standard order which is issued by our [fol. 259] department, and Rule 1372 states that timber or steel be used, and for that reason in the standard order we used the words "timber or steel," but ordinarily in tunnel work they use very little timber.

Q. They use steel for temporary support?

A. I don't know of any temporary support for tunnel work. Temporary support, as I take it, is something that can be removed after its purpose has been served.

Q. Do you know of any temporary supports that are used in the construction of tunnels at any time?

A. Oh, yes, props put in until you can put some permanent timbering in. That has been done a good many times, possibly for a day or a week or until such time as you can control it.

Q. Did you require the timbering which you ordered as a temporary support?

A. Beg pardon?

Q. Did you regard the timber which you ordered in Plaintiff's Exhibit No. 37 as a temporary support?

A. Well, as I say, this is a standard order. I wrote in an order to issue this particular order and it come out of the office this way. I don't think the word "timber" should actually have been in there, but it is a standard order that has been prescribed by the order writers, and that is the way it is written. I mean I don't think the word "timber" has much meaning there. Steel is a form [fol. 260] of timber in our mind.

Q. Timbers could include and mean either wood or steel?

A. Wood or steel.

Q. And would have protected the workmen was all you were concerned about?

A. That's right.

Q. And was it a requirement of Code Rule 1372 to which you refer in your order, that every shaft or tunnel and any working place in the shaft or tunnel shall be when necessary kept adequately and securely timbered to prevent injury to any person from falling material?

A. That's where it stems from, this order.

Q. Have you observed seams and fractures in other shale rock?

A. Yes. I am not—

Q. Just answer the question. Have you observed them?

A. Yes.

COMMISSIONER DAY: He can explain his answer. Go ahead.

THE WITNESS: I was going to say I am not a geologist. I am not too interested in it except when it does involve the safety of the worker, with which I am con-

cerned. Therefore, I am not doing it. I wouldn't do it professionally for any other purpose.

BY MR. METZLER:

Q. Does shale slake off if it has had contact with the [fol. 261] air?

A. It all depends on the type of shale.

Q. Does soft shale ever slake?

A. That still depends on whether there is mud seams to let the air into it deeply or whether it is closely knit.

Q. You are not a geologist, you say, Mr. Worsell?

A. I am not a geologist.

Q. And at the time of your inspection how far into the tunnel did you go?

A. Well, we went some distance beyond the 50-foot line they had supported. I should say we might have gone in 100 feet from each end.

Q. That would be 50 feet beyond the portal ends that were permanently supported?

A. That would be 50 feet beyond the portal ends that were permanently supported. I wouldn't endanger myself to go any further.

Q. Was there water in the tunnel at that time?

A. There was some water. We had on boots.

Q. You referred to a conversation with Mr. Mather where he expressed the opinion that the contractor should install some protection. Do you recall the date of that conversation?

MR. KNOX: I object. He has characterized the testimony of the witness and the witness certainly did not make that statement.

[fol. 262] COMMISSIONER DAY: Let me have that question, Mr. Reporter. (Question read.)

COMMISSIONER DAY: Overruled. I think it is all right.

BY MR. METZLER:

Q. Do you recall the date of that conversation?

A. The date of this conversation was on April 25th, because it was the date I issued the order.

Q. Was anyone else present?

A. I think that there was an engineer from Mr. Mather's office. I am not sure. He introduced me to Mr. Mather. Whether he stayed for the conversation, I don't know. I don't even know his name.

Q. Was it Mr. Losey?

A. I wouldn't know. It is too far away.

Q. Did you make any record of your visit, Mr. Worsell?

A. I did and I sent it into our office, but unfortunately we destroy our records after seven years and they are all destroyed. I wrote a resume of the whole thing and it has been destroyed since.

MR. METZLER: Will you mark this Defendant's Exhibit No. 2, please?

(Rules and regulations of the State Department of Labor of New York were marked Defendant's Exhibit No. 2 for identification.)

[fol. 263] BY MR. METZLER:

Q. I show you a document which has been marked Defendant's Exhibit No. 2 for identification. Are these the rules and regulations of the State Department of Labor of New York which were effective at the time you made your order?

A. These were effective at that time. They have since been changed.

MR. METZLER: Your witness.

REDIRECT EXAMINATION

BY MR. KNOX:

Q. Mr. Worsell, referring to Section 1372, which were contained in your order, of the Industrial Code, the rules, which you have referred to as being contained in your order and which are contained in the rule marked for identification as Defendant's Exhibit No. 2, I note that under "Timbering" for the purpose of these rules: "The term 'timber' shall be held to include and mean all wood to be used by the workmen or all steel or concrete material used in lieu of timber."

Under that provision is that the basis upon which your recommendation was made, in lieu of wood you can use steel; is that it?

A. That is right. That was a common practice in tunneling and that is the reason that that recommendation was made.

Q. In other words, in lieu of timber you can employ the [fol. 264] other two, steel or concrete?

A. Correct.

Q. Mr. Worsell, are you appearing at this trial subject to the service of a subpoena?

A. Yes.

MR. KNOX: I have no further questions.

MR. METZLER: No further questions.

COMMISSIONER DAY: The witness may step aside.

(Witness excused.)

* * * *

[fol. 265] * * *

[fols. 542-543] * * *

[fol. 544] IN THE
UNITED STATES COURT OF CLAIMS

EXCERPTS FROM TRANSCRIPT OF TESTIMONY OF SEPT. 28, 1956

COLLOQUY BETWEEN COMMISSIONER AND COUNSEL

MR. MATTHEWS: Mr. Commissioner, we have been endeavoring to effect a stipulation as to the record taken before the Corps of Engineers Claims and Appeals Board, with Mr. Metzler, for a period of a year. Mr. Metzler advised me that a representative of his office had visited the Board's office and he is of the belief, I understand, that he has compiled such a record. He has it now. I would like to call upon him to produce the record rather than—

MR. METZLER: I am giving counsel for the plaintiff the complete record in so far as I know it to exist and according him full opportunity to make copies or photostats or anything else that he needs.

COMMISSIONER DAY: You have done that?

MR. METZLER: Yes, voluntarily.

COMMISSIONER DAY: I don't think I can call upon him to produce what he has.

MR. MATTHEWS: I have marked for identification as Exhibits Nos. 71 and 72, two communications. Exhibit No. 71 is a communication from R. C. Dunn, Colonel, Corps of Engineers, Division of Engineers, to the Chief of the Engineers Department of the Army dated February 10, 1948. Exhibit No. 72 is a communication from J. F. Campbell, Lt. Col., Corps of Engineers, Acting District Engineer, contracting officer, dated February 10, 1948 to the Chief of Engineers, United States Army, Washington 25, D.C.

[fol. 545] The source of these documents is Mr. Metzler, who advised me, as I stated before, that his office understood from the representative of the Claims and Appeals Board or an engineer that the two documents were before the Corps of Engineers, Claims and Appeals Board, when it rendered its decision. Mr. Metzler stated that he would make no objection to their admittance in evidence

for the purpose of showing that these documents were before the Board at that time. I offer them in evidence, for that purpose.

MR. METZLER: What I stated was that in so far as I know and have been able to ascertain, these two documents were available to the Board as part of the record and I would so stipulate.

COMMISSIONER DAY: That is a very thin line, isn't it?

MR. METZLER: It may be, Mr. Commissioner. Of course I am unable to testify as to what occurred exactly at the hearing because there were many things that probably were known to the attorneys and the parties at that time that were not made a matter of record.

COMMISSIONER DAY: It will be received.

(Communication from R. C. Dunn, Colonel, Corps of Engineers, Division of Engineers, to Chief Engineers Department of the Army, Feb. 10, 1948, was marked Plaintiff's Exhibit No. 71 and made a part of this record.)

[fol. 546] (Communication from J. F. Campbell, Lt. Col, Corps of Engrs., Acting Dist. Engr., Contracting Officer, dated Feb. 10, 1948, to Chief of Engineers, U. S. Army, Washington 25, D. C., was marked Plaintiff's Exhibit No. 72 and made a part of this record.)

MR. MATTHEWS: Mr. Commissioner, I think it would be helpful if pursuant to Rule 27 you would call upon the Corps of Engineers, Claims and Appeals Board, or if it would be possible to arrange for the Court to call upon the Board for a complete list of all documents which were made part of the record in the hearing held on June 17, 1948.

COMMISSIONER DAY: Of course that rule was available to you earlier, Rule 26 to call for any document.

MR. MATTHEWS: As I understand the rule, with respect to calling for documents, Rule 27, upon administrative agencies, Rule 27-A provides that the call is by the Court upon its motion.

COMMISSIONER DAY: At the request of counsel. This is pretty late for that. I don't know how long it would take for them to respond. It certainly seems strange we cannot find out, without all this confusion, just exactly what was before that Board.

MR. MATTHEWS: Mr. Metzler has been trying to accumulate the record date for at least a year.

COMMISSIONER DAY: Can you tell me what was before the Board?

[fol. 547] MR. METZLER: Well, Mr. Commissioner, I am not in a position to testify.

COMMISSIONER DAY: I am not asking you to testify. I called upon you to respond to a request from the Commissioner, do you know, as counsel for the defendant, what was before the Board when this matter was before it?

MR. METZLER: Well, Mr. Commissioner, do you want it in detail?

COMMISSIONER DAY: I would like an answer to my question.

MR. METZLER: What I understand has been before the Board were the findings of fact dated 29 September 1947, that was prepared by Colonel Wanamaker, signed by Colonel Wanamaker and to which were attached Exhibits A to N, all of which have been made available to counsel.

Then there were the contractor's comments on findings of fact by the District Engineer which were signed by Fermo Bianchi, Treasurer of Carlo Bianchi and Company, Inc. Those were apparently issued from the office of Charles MacCarron of Boston, Massachusetts, counsel for the company. Those comments are attached to one exhibit. A letter dated January 14, 1947 which was the contractor's Exhibit A.

Then that appears to have been transmitted on February 18, 1948 to the Chief of Engineers, to the Division Engineer of the North Atlantic Division which is Plaintiff's Exhibit No. 71. That in turn was transmitted by [fol. 548] first endorsement of the North Atlantic Division to the Chief of Engineers under date of March 17, 1948, which is Plaintiff's Exhibit No. 72.

Attached to this communication were Exhibits AA which was also read into the Appeals Board record at the time of the hearing and was a memorandum of C. B. McGavock, Jr., a geologist.

Exhibit BB was a letter of the contractor signed by Peter Bianchi under date of June 23, 1947.

Exhibit CC was a letter dated July 25, 1947 from the contractor signed by Fermo A. Bianchi, Treasurer.

COMMISSIONER DAY: Are you just listing the exhibits now?

MR. METZLER: I believe there is only one additional.

COMMISSIONER DAY: I see.

MR. METZLER: Or two. Exhibit DD was a letter dated August 11, 1947 from Lt. Col. Campbell to the Carlo Bianchi and Company, Inc.

Exhibit EE was a letter from Carlo Bianchi and Company, Inc., dated August 15, 1947.

All these exhibits as I understand were before the Appeals Board at the hearing and then during the course of the hearing there were a large group of photographs introduced, apparently by counsel, but they were not specifically marked in so far as I know by exhibit numbers, or if they were marked by exhibit numbers in any way, all of those photographs were returned [fol. 549] to counsel for the plaintiff. At least I have not been able to find any that are marked by exhibits like 1, 2, 3, et cetera. Then Mr. Knox, do you have the progress schedule which I gave Mr. Matthews yesterday and which he said he would have here today?

MR. KNOX: No, I do not, Mr. Metzler. I just came from Mr. Bradford's office. I think it was being photostated and should be over here. In some way the photostat company did not know who it belonged to. We talked to them this morning. It should be over here in an hour or less.

MR. METZLER: I understand that progress schedule was also before the Board, Mr. Commissioner, and it is my understanding that the contract, the specifications and the drawings were before the Board.

It is also my understanding an exhibit which was similar or perhaps identical with Plaintiff's Exhibit No. 52, this series of drawings, Sheets 1 to 13, was also be-

fore the Engineers Claims and Appeals Board but in so far as I know it was returned to the contractor's attorney and we have not been able to locate it although I asked Mr. Thompson of our office to search for all the documents and he did so and those were available to plaintiff since I believe January, approximately of this year.

COMMISSIONER DAY: Are you finished?

MR. METZLER: Yes. Have I fully covered it?

COMMISSIONER DAY: Then it would seen—

[fol. 550] MR. METZLER: All right.

COMMISSIONER DAY: —that the only place where there is any real confusion is among the photographs. Is that not correct?

MR. KNOX: Mr. Commissioner, if I may reply, I think it is about a year and a half ago in Washington that I prepared rather an elaborate letter endeavoring to identify everything in the Claims and Appeals Board record, including that. I submitted that exhibit together with all the photographs.

COMMISSIONER DAY: That is No. 52 you are talking about?

MR. KNOX: The 13-sheet exhibit, to Mr. Metzler, together with all the photographs that I could identify from the transcript and Mr. Metzler had them, with Mr. Thompson who was working with him for about two months. I was hopeful at that time we could agree if he would stipulate what the record really was. There seemed to be some difficulty, Mr. MacCarron was the attorney representing the plaintiff in that proceeding. I endeavored to get everything I could from Mr. MacCarron. Apparently somewhere along the line, he had turned over some files to King & King in Washington. I never was able to get all the files back. Of course it is a great many years ago and everybody said, everybody advised us they had returned everything. But I do know this, that the photographs that were introduced by the appellant in that particular matter, I was able to identify. I did submit all of those. There are ten photographs ap-

[fol. 551] parently introduced by the Government. Mr. Metzler has those. Mr. Metzler was kind enough to allow us to have possession of all the photographs long enough to try and identify them, which we did.

I think the ten photographs cover, they are the photographs we had listed here, the photographs that were taken by the Board, most of them are identified right in the transcript. The only thing—

COMMISSIONER DAY: Well, it would seem from what I have heard so far about this record before the Board, that both counsel have been trying to find out what it was and to get it into this record and to the extent that they haven't, if the other party wants to rule it out and put before the Court the entire record, well, the court ought to have the entire record.

MR. KNOX: The only one that possesses a complete copy of the record, I believe, is Mr. Metzler.

MR. METZLER: I could not say that, Mr. Commissioner, because in so far as I know there may have been quite a bit of evidence which was considered at the time but was returned to Mr. MacCarron. Mr. Commissioner, I am directed to state that of course, before the Board were the briefs of the parties.

COMMISSIONER DAY: Yes.

MR. METZLER: You see, I neglected to state that. Of course that was part of the record, too.

COMMISSIONER DAY: Yes.

[fol. 552] MR. MATTHEWS: I would like to point out where in this record the various exhibits before the Board are. First I would like to, I have had marked for identification as Plaintiff's Exhibit No. 73 a letter dated September 29, 1947 to Carlo Bianchi and Company, Inc., from W. W. Wanamaker, enclosing his findings of fact, also of the same date consisting of six sheets. I have had marked as Exhibit No. 74 the contractor's comments on findings of fact by the District Engineer consisting of nine sheets. These were, I understand, part of the record before the Board and I offer them in evidence.

MR. METZLER: No objection, subject to comparison.

COMMISSIONER DAY: They may be received on that basis.

(Letter dated September 29, 1947 to Carlo Bianchi and Co., Inc. from W. W. Wanamaker was marked Plaintiff's Exhibit No. 73 and made a part of this record.)

(Contractor's comments on findings of fact, September 29, 1947, 9 sheets, were marked Plaintiff's Exhibit No. 74 and made a part of this record.)

MR. MATTHEWS: Exhibit A, the record before the Board, abstract of bids is, I understand, attached to the contracting officer's findings of fact as Exhibit A in this proceeding. I will identify that in this record. Maybe I can find it now.

I will identify that one later. That is the only one I have not identified.

[fol. 553] There are certain exhibits which have no numbers or letters, which were before the Board.

The decision of the Board is Exhibit No. 1 in this proceeding. The Board's record is Exhibit No. 2. Exhibit No. 3—

COMMISSIONER DAY: Just a minute. You said the decision is Exhibit No. 1?

MR. MATTHEWS: That is what I understand.

COMMISSIONER DAY: I have the record of the transcript as Exhibit No. 1. I made notes, and according to my notes, Exhibit No. 1 is the transcript of the proceedings before the Appeals Board.

MR. MATTHEWS: The record will show the correction.

Exhibit No. 3 is the motion for reconsideration, denied January 4th by the Appeals and Review Board.

Exhibit No. 4-A is the contractor's copy of the contract agreement with the Department of the Army.

Exhibit No. 4-B is a bound set of drawings, with Addendum No. 1.

Exhibit No. 4 in the index of the record of this proceeding is labeled "Part 3" being the modifications and changes of the contract.

Exhibit B in the record before the Board showed the profile and the center line of the outlet, and is indicated in this record at page 24 of the contract drawings, in Exhibit No. 4-B.

[fol. 554] Board Exhibit C is Plaintiff's Exhibit No. 11 in this proceeding.

Board Exhibit D is Plaintiff's Exhibit No. 12 in this proceeding.

Board Exhibit E is Plaintiff's Exhibit No. 15-A.

Board Exhibit F I have had marked as Plaintiff's Exhibit No. 17-A this morning, being a letter to Commercial Shearing, dated January 17, 1947, from the Bianchi Company, signed by T. R. Sullivan.

Exhibit G before the Board is a letter to Mr. Mather, signed by T. R. Sullivan of Bianchi Company, dated January 17, 1947, which I have had marked for identification as Plaintiff's Exhibit B.

I now offer in evidence Plaintiff's Exhibits 17-A and 17-B.

MR. METZLER: No objection, subject to comparison and verification.

COMMISSIONER DAY: They will be received.

(Two-page letter dated January 17, 1947 from Carlo Bianchi and Co., Inc., to the Commercial Shearing & Stamping Co. was marked Plaintiff's Exhibit No. 17-A and made a part of this record.)

(Two-page letter from Carlo Bianchi Co. to U. S. Engineers Offce, attention Mr. Mather, was marked Plaintiff's Exhibit No. 17-B and made a part of this record.)

[fol. 555] MR. MATTHEWS: Board's Exhibit H is Plaintiff's Exhibit No. 18 in this proceeding.

Board's Exhibit I is Plaintiff's Exhibit No. 20.
Board's Exhibit J is Plaintiff's Exhibit No. 21.
Board's Exhibit K is Plaintiff's Exhibits Nos 22 and 23.
Board's Exhibit L is Plaintiff's Exhibit No. 24.
Board's Exhibit M is Plaintiff's Exhibit No. 25.
Board's Exhibit N is Plaintiff's Exhibit No. 29.

The contractor's comments on findings of fact by the District Engineer were an unlettered and unnumbered exhibit by the Board, and were introduced as Plaintiff's Exhibit No. 74 in this proceeding.

The contract, Exhibit A before the Board, is Plaintiff's Exhibit No. 16 in this proceeding.

Board Exhibit AA is a memorandum from Mr. McGavock, Jr. to Chief, Construction Division, dated July 7, 1947, which is in this record.

MR. METZLER: It was read into the record at the Appeals Board hearing.

COMMISSIONER DAY: In the transcript?

MR. METZLER: In the transcript, yes, sir, Mr. Commissioner.

MR. MATTHEWS: Board Exhibit BB is Plaintiff's Exhibit No. 30 in this proceeding.

Board Exhibit CC is Plaintiff's Exhibit No. 32.

[fol. 556] Board Exhibit DD is Plaintiff's Exhibit No. 35.

Board Exhibit EE is Plaintiff's Exhibit No. 36.

The photographs introduced in the record before the Board are not all in this record. All of them except ten photographs, which were exhibits in the Board proceeding, are in the record, and are in the group marked Plaintiff's Exhibits Nos. 39 to 51, inclusive.

We will offer those ten photographs. Mr. Metzler supplied them to us so that we could get copies made but I do not have them here in Court.

COMMISSIONER DAY: Very well.

MR. MATTHEWS. The cross-sections which Mr. Metzler referred to as being an exhibit before the Board are Plaintiff's Exhibit No. 52 in this proceeding.

The only exhibit which I have not identified in this record is Exhibit A before the Board, and I will supply that for the record.

COMMISSIONER DAY: All right.

MR. MATTHEWS: If the Commissioner please, we have prepared a written motion to the Commissioner for leave to take the deposition of Charles A. MacCarron, who was counsel for the contractor in the hearing before the Board. The deposition would be taken on written interrogatories. We present that motion for your later consideration.

COMMISSIONER DAY: Where is Mr. MacCarron now?

[fol. 557] MR. MATTHEWS: As I explained in the motion papers, Mr. MacCarron is confined to his bed, with a serious injury, and the doctor advises that he will have to stay flat on his back for at least ten days, or maybe more. The subject matter about which we wish

to examine Mr. MacCarron is set forth in the motion papers, and relates primarily to Plaintiff's Exhibits Nos. 71 and 72 in this proceeding.

COMMISSIONER DAY: I don't have to ask for any comment from the Government counsel on this matter. I am here to hear the evidence in the case. If it is necessary to repair to wherever the witness might be, I will hear his testimony. That is the purpose of our commissioner system. I understand he is right here in town.

MR. MATTHEWS: We can do it tomorrow afternoon. I am sure it would be agreeable to Mr. MacCarron because he is able to talk on the phone.

COMMISSIONER DAY: I think that is the better way to do it.

* * * *

[fols. 558-665] * * *

[fol. 666] COMMISSIONER DAY: We will now adjourn the hearing to the Kenmore Hotel here in Boston to take the testimony of Mr. MacCarron.

(Whereupon, the hearing was adjourned to Room 20W, Kenmore Hotel, Boston, Massachusetts, at 5:45 o'clock p.m.)

CHARLES A. McCARRON, a witness produced on behalf of the plaintiff, having been first duly sworn by said Commissioner, was examined, and in answer to interrogatories testified as follows:

DIRECT EXAMINATION

BY MR. KNOX:

Q. Will you state your full name and address?

A. Charles A. McCarron. My current address is Hotel Kenmore, Apartment 20-W, Boston.

Q. Will you state your profession?

A. I am a lawyer.

Q. Mr. McCarron, did you represent Carlo Bianchi and Company, Incorporated, in a proceeding concerning a claim on the Almond Dam tunnel made before the Claims

and Appeals Board of the Corps of Engineers, United States Army?

A. Yes.

Q. Were you present at a hearing in Washington before that Board and actively participate in the hearing as an attorney?

[fol. 667] A. I did.

Q. Prior to the hearing before the Claims and Appeals Board, did you have presented to you the engineer's findings of fact?

A. My recollection is that I did.

Q. Did you reply to those?

A. As I recall it, I did, and I think I have a copy of the contractor's comments on findings of fact by District Engineer, if that is what you refer to, Mr. Knox, and that was signed by Fermo A. Bianchi, and it was from the office of Charles A. McCarron, 31 St. James Avenue, Boston 16, Massachusetts, to which apparently was attached a letter from Thomas A. Coyne, Superintendent of Carlo Bianchi and Company, to the War Department, U. S. Engineers, Almond Dam, Post Office Box 171, Hornell, New York, dated January 14, 1947.

Q. Mr. McCarron, are you familiar with the decision of the Claims and Appeals Board?

A. I am.

Q. Did you submit a brief prior to the decision to the Board?

A. I did.

Q. And subsequent to the decision did you correspond with the Chairman of the Board in connection with a reply brief?

A. To my recollection, Mr. Knox, I filed a reply brief [fol. 668] with the Board, which in timing was about coincidental with the decision of the Board. In fact I think I commented on the fact, but my reply brief apparently had not reached the Board before the decision. I may be in error in the timing on it but that is my current recollection.

Q. Now, Mr. McCarron, I hand you Plaintiff's Exhibits Nos. 71 and 72 and ask you whether you have ever had occasion to have these exhibits submitted by the

Claims and Appeals Board to you? I think you will have to do some reading, and it is not very legible.

A. To the best of my knowledge, I never saw either of these exhibits until they were shown to me today.

Q. Mr. McCarron, you will note that both of these letters refer to the claim of the Appellant, namely, Carlo Bianchi and Company, as having a claim for damages of $9,000. I would like to ask you whether or not during the course of the hearing before the Claims and Appeals Board any evidence was submitted by either the defendant or the Appellee and the Appellant concerning damages in connection with the claim of Carlo Bianchi and Company?

MR. METZLER: I think we will stipulate that there was not, because the transcript is in evidence as Plaintiff's Exhibit No. 1.

MR. KNOX: I would like to stipulate with Mr. Metzler in the record that there is no evidence or discussion of damages during the course of the hearing on [fol. 669] Carlo Bianchi and Company's claim before the Appeals Board of the Army Corps of Engineers.

MR. METZLER: Mr. Knox, in so far as I know, everything is in evidence, and there is evidence, of course, which would bear on the damages problem.

MR. KNOX: But not with respect to any amount of damages.

MR. METZLER: I think the Government brief even pointed out there was no question of damages before the Board.

THE WITNESS: If I were to answer that question categorically, I would have to say "no," there was no evidence.

MR. KNOX: These briefs are not in the record, are they?

MR. METZLER: No.

MR. KNOX: I think we will put them in.

(Copy of brief before Claims Board was marked for identification as Plaintiff's Exhibit No. 114.)

BY MR. METZLER:

Q. Mr. McCarron, I refer you to Plaintiff's Exhibit No. 114 marked for identification, which is Appellant's reply

brief before the Corps of Engineers, Appeals and Review Board, and direct your attention to this particular argument, and will you examine it and state whether or not that is your reply brief?

A. I know it is, yes, sir.

Q. In that reply brief did you point out that no evidence was before the Claims and Appeals Board concerning $9,000 damages, indicated and specified in the [fol. 670] opinion and decision of the Claims and Appeals Boards?

A. I wouldn't want to answer that question in just that manner, Mr. Knox. I pointed out, as the brief itself expresses, the fact that "the Appellant was somewhat startled at the statement appearing on page 11 of the Appellee's Brief, being the last paragraph of the so-called 'Statement of Facts,' to the effect that—'The estimated cost of placing this permanent lining is approximately $9,000."

MR. METZLER: That was in the Government brief?

THE WITNESS: That was in the findings of fact, the decision of the Board.

MR. KNOX: It was in the opinion of the Board.

MR. METZLER: I am referring to the statement where it said "the estimated cost."

THE WITNESS: That was in the decision, Mr. Metzler.

MR. METZLER: Yes, sir.

BY MR. KNOX:

Q. Let us clarify it. There was no finding of fact. The Board wrote an opinion.

A. That is right.

Q. And the opinion of the Board is right in the record. I think I introduced it earlier.

MR. METZLER: Yes, sir.

MR. KNOX: And in that opinion it is specifically [fol. 671] stated that the claim of the contractor only involved $9,000. That is in the opinion of the Board. I merely wanted to develop that the Board had something in its opinion which was not in the hearing.

THE WITNESS: I think I pointed out that, at the risk of not answering questions like a lawyer often does, on page 2 of the reply brief it said: "Upon what basis of fact the Appellee should make such a statement is rather mystifying. There is absolutely nothing in the record which contains any reference to the original cost of installing permanent tunnel lining of the type actually installed or of the amount of the Appellant's claim."

BY MR. KNOX:

Q. Mr. McCarron, going back to Plaintiff's Exhibit No. 71 and Plaintiff's Exhibit No. 72, from your examination, did you know that both of these exhibits referred to the Plaintiff's cost as $9,000?

A. I did, sir, at least my attention was called to that by Mr. Gregg.

Q. I also wish to call your attention to the dates appearing on both of these exhibits. Exhibit No. 71 was dated February 10, 1948, and Exhibit No. 72 dated February 18, 1948. Was that previous to the hearing?

A. Yes, it was. The hearing was June 17, 1948, as I recall it.

[fol. 672] Q. Did I understand you to state that the only material which was supplied to you prior to the trial from the Corps of Engineers was the contractor's findings of fact?

A. Let me see if I understand that correctly.

Q. I beg your pardon. Not the contractor's but the contracting officer's findings of fact, to which you made your comments and submitted them.

A. To the best of my knowledge, that is correct. I had a conference in Washington with Mr. Fox, prior to the actual date of the hearing, which might be considered something in the nature of a pre-trial conference, for the purpose of resolving issues, but so far as any material was concerned, I recall of no material, documentary or otherwise, being furnished to me, at least prior to the actual date of the submission of the findings of fact.

MR. KNOX: I believe that is all.

CROSS-EXAMINATION

BY MR. METZLER:

Q. Did you have the opportunity to present any exhibits which you wished at the hearing, Mr. McCarron?

A. I would say yes.

Q. How long have you been practicing law?

A. Almost 35 years.

Q. You are a graduate of what school?

A. Northeastern University Law School.

[fol. 673] Q. In Boston?

A. In Boston.

Q. The Board actually did not pass on any question of damages, when they submitted the opinion, but they merely referred to their understanding that the appeal involved $9,000; is not that right?

A. I would rather not characterize the opinion of the Board as such. That reference to $9,000 was in their decision.

Q. Yes, that is correct. What I mean by that is that they did not pass on any individual items of damages or on damages as a whole?

A. Actually, there was no evidence before them upon which they could pass.

Q. That is correct. You did not present any evidence on damages?

A. That is correct.

Q. And the Government did not present any?

A. That is right.

Q. So from the standpoint of having a decision on the damage issue, you did not feel that you were prejudiced by any decision on a damage item?

A. I certainly did when I read that finding.

Q. What item of damage did you think the Board had considered?

A. I haven't the faintest idea. If you will look at my [fol. 674] letter to Colonel Milenz, of December 20, 1948, I think that states about as clearly as anything could what was my thinking on the subject at the time.

Q. Had you had any conferences with the Board prior to the time that your appeal was heard?

A. One with Mr. Fox.

Q. Mr. Fox was the Government attorney. He was not a membor of the Board?

A. He was secretary of the Board, as I recall.

MR. KNOX: I think he was acting as a recorder or attorney, was he not?

THE WITNESS: Something like that. He had a dual capacity.

BY MR. METZLER:

Q. Did you and Mr. Fox have any conference with reference to what evidence would be presented before the Board?

A. I couldn't tell you today just what the general nature of the conference was, but it generally had to do with the forthcoming hearing. Whether it was to limit the scope of the hearing, or what could be agreed upon, frankly at this time I wouldn't remember.

Q. Did you submit your evidence to the Board during the course of the hearing?

A. Oh, yes.

MR. METZLER: Mr. Commissioner, I think I made an observation which might not be on the record. I have not read the contractor's comments on the findings of [fol. 675] fact, and I should say that I do not believe I have had an opportunity to read them thoroughly but I have looked at them to see whether that was among the exhibits which were introduced in evidence.

MR. KNOX: Those are not the Board's findings, Mr. Metzler. You must remember that. The findings are not the findings of the Board. That was the position of the contracting officer under their procedure.

COMMISSIONER DAY: That is what you were appealing from.

MR. KNOX: Yes, to the Board, but we are talking about the decision of the Board now.

COMMISSIONER DAY: Very well.

BY MR. METZLER:

Q. Mr. McCarron, the hearing was held on June 17, 1948?

A. That is correct.

Q. And then there was a considerable interval before the briefs were filed? How do you account for that?

A. I honestly can't account for it. Maybe I asked for a considerable amount of time. It was obviously by agreement, but, knowing myself, I wouldn't say I did not ask for it.

Q. I note that your brief was apparently filed on October 29, 1948.

A. That is right.

Q. The Board gave you a considerable period in which to file your brief.

[fol. 676] A. That is right. I assume—and of course I have got a very skeleton file—that briefs on behalf of both parties were filed at about the same time and were exchanged. My only copy, which is marked "Final Draft" is dated October 29, 1948.

Q. I notice that the Government pointed out in its brief as follows:

> "It is Appellant's position that * * * the only question is whether or not the conditions found in the process of pouring this tunnel, or the condition of this rock was such that good engineering required that some form of tunnel protection must be installed, and whether the Resident Engineer and his associates acted reasonably in withholding that direction, although in substance approving the action of the contractor in installing it, but saying that it would be at its own expense. (Transcript, page 7)."

Does not that make it clear to you that the Government attorney, who I believe was Mr. W. H. Fox, also advised the Board that the question of damages was not before it for consideration?

A. I do not think there is any question that we were both of the opinion that the question of damages would not then be presented until a determination had been made of the merits of the contractor's claim for additional compensation.

Q. Wouldn't you say that that statement of Attorney [fol. 677] Fox was a fair statement to the Board, and indicated that damages were not an issue at that time?

A. I would not say that, Mr. Metzler. Damages were always an issue.

Q. Yes, damages are always an issue, as you say?

A. Yes.

Q. But in so far as the matter before the Board on damages is concerned, they were not an issue?

A. At that time?

Q. At that time.

A. That is correct.

Q. What I meant by that was, Attorney Fox carefully pointed that out even in his own brief.

A. I haven't a copy of Mr. Fox's brief, unfortunately, but I am sure you read it correctly.

MR. METZLER: I do not think I have any further questions.

REDIRECT EXAMINATION

MR. KNOX: Will you mark this document as the next Plaintiff's exhibit for identification, Mr. Reporter?

(Two-page letter dated Dec. 20, 1948 from Charles A. McCarron to Col. Mielenz was marked for identification as Plaintiff's Exhibit No. 115.)

BY MR. KNOX:

Q. Mr. McCarron, is this a copy of your letter to Colonel Mielenz?

[fol. 678] A. Yes, it is.

MR. KNOX: I would like to offer that into evidence, Mr. Commissioner.

MR. METZLER: No objection.

COMMISSIONER DAY: Admitted.

(The document heretofore marked for identification Plaintiff's Exhibit No. 115 was made a part of this record.)

MR. KNOX: I would like to ask one more question of the witness, Mr. Metzler, and I would like to show you this, so that you may not object to what I am reading from. This is in the record but not this copy. This is a mimeographed copy.

MR. METZLER: You can mark it.

MR. KNOX: It is already in the record, you know.
MR. METZLER: All right.

BY MR. KNOX:

Q. Mr. McCarron, I hand you Plaintiff's Exhibit No. .... which is the decision of the Engineers Claims and Appeals Board, decision No. 14, relating to the appeal of Carlo Bianchi and Company, Inc., Contract No. W 30-180-eng-397, and refer you to the third paragraph, which reads:

> "Appellant's appeal arises out of the construction of outlet works in connection with the construction of the dam, consisting of an intake structure and operating house, concrete lined tunnel, stilling basin, and approach and outlet channels. Specifically, Appellant claims approximately $9,000 additional com-
> [fol. 679] pensation under Article 4 of the contract because of changed conditions allegedly encountered in connection with the construction of the tunnel. This sum represents the cost of furnishing and placing of permanent tunnel lining over and above that required by the contract, or in excess of 50 feet of steel lining required to be installed at each end of the tunnel as indicated in the drawings and as determined by the contracting officer."

As an attorney, did you consider that finding of fact by the Board?
A. I think as an attorney I wanted to answer it.
MR. METZLER: I object to that.
COMMISSIONER DAY: Sustained.
MR. KNOX: I will reframe the question.

BY MR. KNOX:

Q. Is that the paragraph to which you directed your reply brief?
A. It certainly is.
MR. KNOX: I think that is all.

* * * *

[fol. 680] IN THE
UNITED STATES COURT OF CLAIMS

No. 466-54

* * * *

CARLO BIANCHI AND COMPANY, INC.

v.

THE UNITED STATES

Mr. Robert Knox for the plaintiff. *Messrs. Robert F. Bradford* and *William H. Matthews* were on the briefs.

Mr. Martin E. Rendelman, with whom was *Mr. Assistant Attorney General George Cochran Doub*, for the defendant.

OPINION—January 14, 1959

MADDEN, *Judge*, delivered the opinion of the court:

The plaintiff claims that in performing a contract with the Corps of Engineers of the War Department, it encountered changed conditions within the scope of Article 4 of its contract which caused it to incur extra expense for which the Government should have paid but did not.

The contract was made in July 1946. The plaintiff was to build an earthen dam across Canacadea Creek at Almond, Steuben County, New York. One item of the work was the blasting through rock of a tunnel some 710 feet long. The blasted area was to be approximately 17 feet in diameter and the finished bore after the construction of the concrete lining was to be 13 feet in diameter. All of the work under the contract was completed on time, the contract completion date, as extended, being June 30, 1949.

The Army Engineers had made test borings in the area through which the tunnel was to be built. The invitation for bids, upon which the plaintiff had acted in submitting its bid, contained the standard provisions requiring the bidder to investigate the site and learn all that [fol. 681] could be learned about the conditions which would be encountered in the performance of the contract.

The plaintiff made a thorough examination of the nature of the rock, wherever it was exposed in the area, and of the logs of the test borings made by the Army Engineers. The logs of the borings indicated that, except for a distance of about fifty feet at each end of the tunnel, over which the rock covering would be relatively shallow, the rock through which the tunnel would pass would be "unweathered" rock, i. e. rock without seams in which clay or mud had accumulated. The importance of the unweathered condition of the rock is that such rock would better remain in place in the roof of the tunnel without vertical support when the tunnel was blasted through.

The specifications contemplated instability of the rock for fifty feet at each end of the tunnel. They provided for the insertion in these locations of strong steel ribs set four feet apart, with steel "liner plates" one-eighth of an inch thick on top of them.

The plaintiff's excavation subcontractor, experienced in tunnel work, blasted out the tunnel. A good deal of rock fell from above the required height of the tunnel. The fall from the blasting and the overbreak was "mucked" out by the night crew. No cribbing or other temporary protection against falling rock was used at this stage of the work. The blasting through of the tunnel was begun in December 1946 and finished by March 12, 1947, all in winter weather.

Because of the considerable excess fall of rock while the tunnel was being blasted through, the plaintiff requested the Government's resident engineer to authorize the installation of steel ribs and liner plates through the entire length of the tunnel, this additional material to be paid for by the Government. The resident engineer replied that unless there were indications that the tunnel would cave in, such authority would not be given.

The plaintiff, in correspondence during the next several months, repeated its request, which the Government repeatedly denied. The plaintiff caused the situation to be examined by several experts. They found that, throughout the length of the tunnel, the rock contained seams filled with mud and clay; that these seams were saturated

with water and offered little resistance to the fall of the [fol. 682] rock when its vertical support had been removed. Since the tunnel had been blasted through in the winter when no moisture could enter the ground from the surface, which was about 100 feet above the tunnel, the rock was relatively stable at that time. When the ground at the surface thawed and the spring rains came, the saturation of the seams in the rock occurred or was increased, as was the instability of the overlying rock.

In the disputation in the writings of the parties, the Government took the position that all that was needed was "temporary protection" sufficient to enable the workmen to safely clear out the tunnel and construct the concrete lining. If that was all that was needed, it was no more than the plaintiff had contracted to do, at its own expense. Such protection would, apparently, have been wooden cribbing, sufficiently strong to prevent a relatively small volume of rock from crashing to the floor of the tunnel.

The plaintiff's contention was, and is, that the rock above the tunnel was so unstable that unless "permanent protection" was installed, of a kind which would have to remain imbedded in the concrete lining of the tunnel, not only would the workmen be endangered but the tunnel could not be completed because of the danger of large falls of rocks which would make it impossible or impracticable to properly construct the concrete lining.

On May 5, 1947, the contracting officer formally notified the plaintiff that it was his decision that no additional steel tunnel lining would be authorized to be placed at the expense of the Government. The plaintiff, on May 29, filed an appeal from the contracting officer's decision. It also renewed its request to the contratcing officer for approval of the steel permanent protection which it proposed to use. On June 13, 1947, the contracting officer advised the plaintiff that it might install the proposed steel protection if it chose to do so, but that the Government thought that the installation was more expensive than was necessary; that nothing more than temporary protection, which the plaintiff was under a duty to fur-

nish, was necessary; and that the Government would not pay the cost of either kind of protection. This letter suggested and recommended to the plaintiff a lighter and less expensive type of protection.

[fol. 683] The plaintiff in further correspondence, informed the contracting officer of the advice which it had received from expert consultants that the type of protection recommended by the contracting officer would be inadequate and unsafe. It then proposed a design, of steel protection, with detailed specifications, and requested approval of the design. On August 11, 1947, the contracting officer approved the use of the plaintiff's design, saying, however, that it was unnecessarily strong and expensive and that the Government would not pay for it unless higher authority reversed his decision. The plaintiff then proceeded to install the permanent protection and completed the lining of the tunnel on May 8, 1948.

The Claims and Appeals Board denied the plaintiff's appeal on December 14, 1948.

The evidence does not tell us in detail what the process of constructing the lining of the top of the tunnel would have been, if only temporary protection had been installed, so that there would have been no steel ribs and lining plates to serve as a form for the lining. Presumably, removal wooden forms would have been used and the space above them would have been packed with rocks and concrete and the voids filled with cement grouting. The evidence seems to us to be quite overwhelming that, the condition of instability of the rock above the tunnel being what it was, it would not have been practical to construct the lining of the tunnel by that method. There would quite certainly have been a large number of heavy rock falls during the several months of the construction of the tunnel lining, and the rearrangement of the fallen rocks and the packing of the voids in such a way that the arch of the tunnel would support the unstable weight above it, when the forms were removed, would have been a difficult if not an impossible task. All the risks of the success of this task would have fallen on the plaintiff, since it had contracted to constructed a permanent and usable tunnel.

The plaintiff says, and we have found as a fact, that the weathered and unstable condition of the rock through which the tunnel was blasted was an unforeseen condition. The contract contained the usual Article 4 of Government construction contracts, relating to subsurface or [fol. 684] latent unforeseen conditions. The Article is quoted in our findings of fact. The unforeseen condition having arisen, the Government was under a contractual duty to pay the plaintiff the cost of solving the difficulty. The contracting officials were adamant in their position that "temporary protection" would solve the problem. It is possible that it would have, but the evidence to the contrary was so strong that it would have been foolhardy of the plaintiff to proceed on the Government's advice, but at the plaintiff's own risk.

We get from the record the impression that the Government officials, in their correspondence with the plaintiff in the spring and summer of 1947, kept their minds almost exclusively upon the text of the contract, and paid little attention to the conditions in the tunnel. Those conditions had changed importantly after the spring thaw and rains had saturated the unforeseen clay and mud in the seams of the rocks. The communications of the Government officials kept harking back to the duty of the contractor to examine the site and the test borings and learn what could be learned about the difficulties which would be encountered. But the plaintiff had done that, and had not learned of the difficulties which in fact developed. The purpose of Article 4 of the contract was to insure the contractor against that very contingency.

The contract required the contractor to protect its workmen against harm from falling rocks, and to produce a safe, solid, usable tunnel. We think the Government officials felt that they could save the Government money and at the same time subject the Government to no risk, by standing on the terms of the contract. If the temporary protection which they insisted was sufficient did not produce a good tunnel, the contractor was still obligated to produce a good tunnel, and the Government could not lose by the experiment.

The Government urges that the plaintiff's difficulties were of the plaintiff's own making; that if it had proceeded immediately to line the tunnel after it had holed it through, the rock would not have been so unstable. The Government urges that the strong current of air which blew through the tunnel after it was holed through made the rock unstable, and that the tarpaulin coverings over the openings were not sufficiently airtight. It would [fol. 685] difficult to maintain an airtight seal over the ends of a tunnel which was being worked in. And we think a current of air blowing through a tunnel, the roof of which was dripping with water, would have had no significant effect upon the stability of the rock in and above the roof.

The Government claims finality for the decision of the contracting officer, affirmed by the Claims and Appeals Board. Under the Act of May 11, 1954, 68 Stat. 81, the "Wunderlich Act", that decision does not have finality unless it is supported by substantial evidence. We think that on consideration of all the evidence, the contracting officer's decision cannot be said to have substantial support.

The Government urges that in this case the plaintiff did not present its case fully to the Claims and Appeals Board, since it presented only four witnesses before the Board, but presented fifteen witnesses at its trial in this court. The Government says that the plaintiff used the Board as a mere waystation in its progress to this court, and thus did not give the Board a fair chance to decide the case on substantially the same evidence which has been presented in this court. So far as concerns the difference in the number of witnesses, several of the additional witnesses in this court gave unimportant testimony. But some of the expert witnesses who did give important testimony in this court, did not testify before the Board.

In our opinion in *Volentine and Littleton* v. *United States*, 136 C. Cls. 638, holding that the trial in this court should not be limited to the record made before the contracting agency, but should be *de novo*, we recognized that there were logical weaknesses in our position. We

concluded, however, that the intent of Congress in enacting the Wunderlich Act was in accord with our conclusion, and we adhere to that conclusion in this case.

The plaintiff claims that, in addition to the extra expense of installing the permanent steel protection in the tunnel, it was put to extra expense by being delayed by the contracting officer's refusal for a considerable time to authorize it to install the permanent protection. The plaintiff says that the delay threw the work of constructing the concrete lining of the tunnel into the winter months, so that it had to heat its concrete and incur other extra costs on that account. We have found that [fol. 686] there was delay and expense resulting from the cause alleged by the plaintiff. *F. H. McGraw and Company* v. *United States*, 113 C. Cls. 29.

By stipulation of the parties, the instant proceeding has been limited to the decision of the question of liability. Our conclusion is that there is liability of the defendant to the plaintiff. The amount of the plaintiff's recovery will be determined pursuant to Rule 38 (c).

It is so ordered.

MCLAUGHLIN, *District Judge*, sitting by designation; WHITAKER, *Judge*; and JONES, *Chief Judge*, concur.

LARAMORE, *Judge*, took no part in the consideration and decision of this case.

FINDINGS OF FACT

The court, having considered the evidence, the report of Commissioner William E. Day, and the briefs and argument of counsel, makes findings of fact as follows:

1. Plaintiff is a corporation organized and existing pursuant to the laws of the Commonwealth of Massachusetts with its principal office and place of business in Framingham, Massachusetts.

2. On or about July 3, 1946, the plaintiff and the defendant, acting through the War Department, Corps of Engineers, as a result of competitive bids submitted, entered into a contract for thhe construction of an earthen dam across Canacadea Creek, Almond, Steuben County,

New York. The work was to be performed in strict accordance with the specifications, schedules and drawings (which were prepared by the defendant) for an estimated consideration of $3,330,330 based upon unit prices for the various categories of work items. The contract provided that work should begin within 10 days after receipt by the plaintiff of notice to proceed, and be completed not later than 900 calendar days after that date. The time for completion of performance was extended to June 30, 1949, by Modification No. 15. The work was satisfactorily completed on that date and formally accepted on behalf of the defendant by the contracting officer by letter of July 20, 1949.

3. Pursuant to Rule 38 (c), by stipulation between the parties hereto, the trial was limited to the issues of law [fol. 687] and fact relating to the right of plaintiff to recover, reserving for determination by further proceedings, if necessary, the amount of recovery.

4. The contract specifications provided for the blasting through rock of a tunnel approximately 710 feet long for the diversion of water. Before placement of the concrete lining, the bore of the tunnel was approximately 17 feet in diameter. The finished bore with concrete lining in place was 13 feet in diameter. This action was brought to recover increased costs which the plaintiff says it incurred by reason of changed conditions encountered which required the installation of steel tunnel protection in the form of steel arch ribs and liner plates throughout the length of the tunnel, and also by reason of alleged delays in the work because of the failure and refusal by the defendant to direct the installation of such support as a pay item.

5. Pertinent and material provisions of the plaintiff's contract are as follows:

> ARTICLE 4. *Changed conditions.*—Should the contractor encounter, or the Government discover, during the progress of the work subsurface and/or latent conditions at the site materially differing from those shown on the drawings or indicated in the specifications, or unknown conditions of an unusual nature differing materially from those ordinarily encoun-

tered and generally recognized as inhering in work of the character provided for in the plans and specifications, the attention of the contracting officer shall be called immediately to such conditions before they are disturbed. The Contracting Officer shall thereupon promptly investigate the conditions, and if he finds that they do so materially differ the contract shall with the written approval of the Secretary of War or his duly authorized representative, be modified to provide for any increase or decrease of cost and/or difference in time resulting from such conditions.

ARTICLE 5. *Extras.*—Except as otherwise herein provided, no charge for any extra work or material will be allowed unless the same has been ordered in writing by the contracting officer and the price stated in such order.

* * * * *

ARTICLE 15. *Disputes.*—Except as otherwise specifically provided in this contract, all disputes concerning questions of fact arising under this contract shall be decided by the contracting officer subject to
[fol. 688] written appeal by the contractor within 30 days to the head of the department concerned or his duly authorized representative, whose decision shall be final and conclusive upon the parties thereto. In the meantime the contractor shall diligently proceed with the work as directed.

* * * * *

ARTICLE 25. *Accident Prevention.*—In order to protect the life and health of employees in the performance of this contract, the contractor will comply with all pertinent provisions of the "Safety Requirements for Excavation—Building—Construction" approved by the Chief of Engineers, December 16, 1941, as revised 15 March 1943 (a copy of which is on file in the office of the contracting officer) and as may be amended, and will take or cause to be taken such additional measures as the contracting officer may determine to be reasonably necessary for

this purpose. The contractor will maintain an accurate record of and will report to the contracting officer in the manner and on the forms prescribed by the contracting officer, all cases of death, occupational disease and traumatic injury arising out of or in the course of employment on work under this contract. The contracting officer will notify the contractor of any non-compliance with the foregoing provisions and the action to be taken. The contractor shall, after receipt of such notice, immediately correct the conditions to which attention has been directed. Such notice, when served on the contractor or his representatives at the site of the work, shall be deemed sufficient for the purpose aforesaid. If the contractor fails or refuses to comply promptly, the contracting officer may issue an order stopping all or any part of the work. When satisfactory corrective action is taken, a start order will be issued. No part of the time lost due to any such stop order shall be made the subject of claim for extension of time or for excess costs or damages by the contractor.

6. Pertinent and material provisions of the specifications made a part of the contract are as follows:

GC-3. *SITE INVESTIGATION AND REPRESENTATIONS.*—The Contractor acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties
[fol. 689] of weather, river stages, tides or similar physical conditions at the site, *the conformation and condition of the ground, the character, quality and quantity of surface and subsurface materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the work* [Italics supplied] and all other matters which can in any way affect the work or the cost thereof under this contract. Any failure by the Contractor to acquaint himself with all the available

information concerning these conditions will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Government assumes no responsibility for any understanding or representations made by any of its officers or agents during or prior to the negotiation and execution of this contract, unless (1) such understanding or representations are expressly stated in the contract and (2) the contract expressly provides that responsibilty therefor is assumed by the Government. Representations made but not so expressly stated and for which liability is not expressly assumed by the Government in the contract shall be deemed only for the information of the Contractor and the Government will not be liable or responsible therefor.

* * * * *

TP4-02. *TUNNEL EXCAVATION.—d. Scope.* —The tunnel bore may be driven from either or both ends by any of the usual methods of tunneling, provided the driving is continuous and progress is consistent with that indicated on the progress schedule. *Temporary tunnel protection shall be provided where required for safety of the workmen and shall be placed progressively after each heading blast* [Italics supplied] and prior to resumption of excavation and drilling operations. The tunnel shall be maintained free of water by means of drains and sump pumps. Tunnel dust shall be kept under proper control by wet drilling and sprinkling. The tunnel shall be adequately lighted and ventilated. Only electric or air motorized equipment shall be used in the tunnel. An adequate power supply shall be available at all times. All rock projections inside the tunnel neat line shall be removed and overbreak beyond the tunnel pay line shall be backfilled with approved material, compacted to the required density without cost to the Government. Where and as the arch ribs and liner plates are placed to the designated grade and alignment, the overbreak voids at the crown and haunches shall be progressively backpacked with se-

lected tunnel excavation in a way that will hold the
[fol. 690] completed tunnel protection on line and grade. Where such tunnel protection is not required all overbreak beyond the tunnel pay line shall be backfilled with concrete. Such work shall be done together with placing of the concrete tunnel lining. After the concrete tunnel lining is in place and prior to tunnel and collar grouting the entire length of the tunnel shall be grouted at a pressure not to exceed five pounds to complete filling remaining overbreak voids. Such grouting including furnishing and placing of grout pipes will not be paid for as a unit and all costs shall be included in the contract unit price for tunnel concrete lining. Disposal of tunnel excavation shall be in accordance with subparagraph TP3-01.

b. Blasting.—Blasting procedure shall be in accordance with subparagraph TP-305 *b* (3). At the outset and as the work progresses throughout the length of the tunnel, the breaking qualities of the rock structure encountered shall be observed and the spacing, depth, loading and shooting sequence of the holes shall be adjusted accordingly so as to keep to a minimum overbreak and shattering of the rock formation outside the tunnel excavation limits. The Contractor shall be responsible for all overbreak and shall replace it with approved material and placing methods without cost to the Government. All blast-loosened rock still in place shall be immediately broken out or working conditions otherwise made safe by the placing of temporary protection.

TP4-03. *TUNNEL PROTECTION.*—*a. Scope.*—Tunnel protection shall be furnished and placed as required for distances of approximately the first 50 feet at each end of the tunnel which includes the underground portion of the outlet transition. Such tunnel protection conforming to the cross sectional shape of the tunnel and transition, shall consist of steel arch ribs and corrugated steel liner plates as indicated on the drawings or required, including tie

rods and spreaders. Liner plates shall be placed before the setting of ribs. In erecting, each arch rib shall be properly spaced, set to the designated grade and alignment, and in a position normal to the tunnel axis. Each rib shall be connected to each successive one by seven (7) sets of steel tie rods and pine spreaders, uniformly spaced. The Contractor shall submit detail drawings indicating fabrication, splicing of ribs and erection methods of the proposed tunnel protection. No material delivery shall be made prior to receipt of the Contracting Officer's written approval but such approval shall not relieve the Contractor of his sole responsibility for damage
[fol. 691] resulting from the inadequacy or lack of such protection. Steel for arch ribs, liner and splice plates, tie rods and other items necessary to tunnel protection shall be commercial products and shapes having the necessary physical and chemical qualities for the intended purpose and shall be fabricated according to the best standard practice. The erection of such tunnel protection shall be carried as close to heading blasting as is feasible without undue damage to tunnel protection in place.

b. Steel Tunnel Protection Supports.—Steel arch rib tunnel protection supports shall be erected in the tunnel sections, where tunnel protection is indicated on the drawings or directed by the Contracting Officer and shall be steel I-beams of the size, weight and length, and bent to the shape indicated on the drawings. The maximum center to center spacing shall be as designated. Suitable dowels shall be provided at the invert to maintain foot of ribs in proper position. Tie rods and spreaders shall be installed at the same time ribs are set. Blocking and other timber required for erection shall be furnished by the Contractor. Arch rib splicing, limited to two for each rib, shall develop the full strength of the rib. Steel ribs shall be left in place and embedded in the concrete tunnel lining.

c. Steel Liner Plates.—Steel liner plates for tunnel protection shall be placed in the tunnel sections, where such protection material is indicated on the drawings or directed, to furnish coverage for the tunnel roof section above the spring line. The ends of plates in adjoining rows shall be staggered and half plates furnished where necessary for this purpose. Liner plates shall be left in place and have concrete tunnel lining placed against their inner surfaces. Liner plates shall be fabricated corrugated steel plates not less than number three (3) gauge, bent to the designated radius and pressed into the required shape consisting of integral side with square corners and elongated holes for connecting bolts, similar and equal to Armco Type 18-inch section.

TP4-04. *CONCRETE TUNNEL LINING.—a. Scope.*—The entire tunnel bore including the outlet transition shall be lined with concrete which shall conform to the applicable requirements of Section X. *No tunnel concrete shall be placed prior to the completion of the entire tunnel bore, then its placement shall be expeditiously prosecuted to completion.* * * * [Italics supplied]

* * * * *

[fol. 692] TP4-08. *PAYMENT.—a. Tunnel Excavation.*—Payment for tunnel excavation will be made at the contract unit price for "Tunnel Excavation—Unclassified," Item No. 10. No payment will be made for excavation beyond the pay line and all such overbreak shall be filled with suitable material or concrete as required without cost to the Government. The contract unit price shall include all costs of drilling, blasting, excavation, hauling, and disposal as specified in paragraph TP3-01d.

b. Tunnel Protection.—Payment for all costs of furnishing and placing liner plates, and tunnel supports, including tie rods and pipe spreaders, specified herein or directed by the Contracting Officer, will be made at the applicable contract unit price

for "Steel Liner Plates," Item No. 11 and "Steel Tunnel Supports," Item No. 12. Partial payments will be made according to paragraph TP11-14.

c. Concrete Tunnel Lining.—Payment for furnishing and placing concrete lining in the tunnel, except the furnishing of cement, will be made at the contract unit price for "Concrete in Tunnel," Item No. 34. Payment for furnishing cement will be made at the contract unit price for "Cement," Item No. 36. All costs of concrete or repair grouting required to fill overbreak voids outside the pay line shall be included in the contract unit price for Item No. 34.

d. Reinforcing Steel.—Payment for reinforcing steel, placed as shown on the drawings or directed, will be made at the contract unit price for "Steel, Concrete Reinforcement," Item No. 38. (See subparagraph TP10-22*c*.)

* * * * *

TP10-01. *SCOPE OF THE WORK.*—The work covered by this Section consists of furnishing all material and equipment and performing all labor for the manufacture, transporting, placing, finishing, and curing of concrete in the structures included in these specifications.

* * * * *

TP10-22. *MEASUREMENT AND PAYMENT.*—
a. Concrete. * * *

b. Portland Cement. * * *

c. Reinforcement.—(1) Measurement of reinforcement will be made of the lengths of bars actually placed in accordance with the drawings or bar schedules approved by the Contracting Officer, or in accordance with the instructions of the Contracting Officer. The measured lengths will be converted to
[fol. 693] weights for the size of bars listed by the use of the unit weights per lineal foot stated in Federal Specifications QQ-B-71a, I-5. Steel in laps indicated on the drawings or required by the Contracting Offi-

cer will be paid for at the contract unit price. No payment will be made for the additional steel in laps which are authorized for the convenience of the Contractor. Furnishing and placing reinforcement bars will be paid for at the contract unit price per pound for Item No. 38, "Steel, Reinforcement."

* * * * *

7. The Cabot Construction Company, plaintiff's subcontractor, performed the work of drilling, blasting and mucking in the driving of the tunnel. The Cabot firm was unusually qualified in that kind of work. The work of driving the tunnel was accomplished essentially on schedule, in a workmanlike manner and with dispatch, but not without difficulty.

8. The plaintiff upon receiving the invitation to bid for the contract, made a thorough investigation of the site. The plaintiff's chief engineer, president and general superintendent visited the site of the Almond Dam and tunnel on or about March 1, 1946. They looked for all open cut rock in the vicinity of the proposed dam on highways and the railroad nearby which might disclose the nature of the rock that would be encountered in the course of construction. To acquaint themselves as to the type of material to be encountered, they examined the area of the dam, the borrow area sites and any test pits in those areas, the site where the railroad and the highway were to be relocated, the site of the stilling basin at the tunnel outlet portal, the site of the tunnel inlet portal and the site of the spillway. The only exposed rock was near the railroad, across the valley from the tunnel and at a higher elevation. They did not find any exposed rock in the area laid out for the Almond Tunnel. They examined the specifications, schedules and drawings relating to the diversion tunnel included in the contract work. They examined the logs of the borings as shown in the contract drawings but did not examine the cores which were available for inspection at the U.S. Engineer Soils Laboratory at Ithaca, New York.

9. The Cabot firm began the driving of the tunnel on December 12, 1946. It was engaged prior to that time [fol. 694] in open cut excavation of rock adjacent to both

the outlet and inlet areas of the tunnel. The existence of mud seams beyond the pay line on vertical slopes at the outlet end near the stilling basin caused considerable overbreak there, and resulted in apprehension on the part of the plaintiff and its subcontractor as to conditions which might be encountered as the tunnel excavation progressed. On December 10, 1946, representatives of both firms went to Baltimore, Maryland to confer with the contracting officer as to these matters. They conferred with Colonel J. S. Seybold, who told them that he would visit the site. He did so on December 12, 1946, but did not confer at the site with the plaintiff. The contracting officer (who was also district engineer at Baltimore) conferred at the site of the work with the resident engineer. As a result of the discussions referred to above payment of about $8,000 was authorized and thereafter accomplished near the outlet area of the tunnel, for overbreak due to a vertical mud seam.

10. The crew of workmen who were engaged in driving the tunnel consisted of eleven men and a superintendent on the day shift who were engaged in drilling operations, and five men on the night shift who were engaged in mucking operations, that is, cleaning out and hauling away the rock which had been blasted after the drilling operation.

11. From the beginning of the work on the tunnel, Mr. E. F. Diehl, Vice President and Chief Engineer of Cabot Construction Company and Mr. W. D. Dunham, President of that firm, urged Mr. D. H. Mather, defendant's Resident Engineer, to make provisions to have additional steel on the job to prevent delay in the driving of the tunnel. They were advised that the only steel which would be provided would be for the 50 feet at the outlet portal and 50 feet at the inlet portal. Cabot proceeded with tunnel work at the outlet end, erecting the steel arch supports and liner plates for the first 50 feet. The roof of the tunnel for the first 50 feet was badly jointed. There were vertical intersecting seams filled with mud. The steel arch ribs were placed at 4-foot intervals as the drilling operations progressed. The liner plates were placed above the ribs. As the drilling con-

tinued beyond the 50 feet at the outlet end, the condition of the roof was about the same for the next 16 feet. The [fol. 695] Cabot firm requested and was given permission to install four additional units of the steel arch ribs and 16 additional feet of liner plate at the outlet end. In effect, this steel was borrowed from that which was on hand for use at the inlet end of the tunnel. When it became necessary to remove the borrowed steel for use at the inlet end, approximately 5 cubic yards of rock fell from the roof.

12. The plaintiff wrote the following letter to the resident engineer on December 18, 1946, concerning the borrowing of steel for the 16 feet of tunnel mentioned above:

> Reference is made to a recent discussion which you had with Mr. Diehl and Mr. Dunham of Cabot Construction Corporation, relative to steel tunnel supports in the tunnel outlet transition.
>
> We have a communication from them stating that they agree to replace steel supports damaged by blasting and rejected for that reason.
>
> We concur with them in this respect and will replace steel supports so damaged at no additional cost to the government.

On December 20, 1946, the resident engineer replied to the above as follows:

> The receipt is hereby acknowledged of your letter of 18 December 1946 relative to steel tunnel supports in the tunnel outlet transition.
>
> The agreement made as stated in your letter is satisfactory.
>
> It is thought that the cause of the difference of opinion in this matter was due to a misunderstanding of the use to which Mr. Dunham of the Cabot Construction Corporation, proposed to put the tunnel supports and to clarify the Government's position, the following references to the specifications are made.
>
> a. TP4-02. *Tunnel Excavation. a. Scope.*—Temporary tunnel protection shall be provided for the

safety of the workmen and shall be placed progressively after each heading blast *and prior to resumption of excavating and drilling operations.*

b. TP4-03. *Tunnel Protection. a. Scope.*—Tunnel protection shall be furnished and placed as required for distances of approximately the first 50 feet at each end of the tunnel which includes the underground portion of the outlet transition.—The erection of such tunnel protection shall be carried as close to heading blasting as is feasible without undue damage to tunnel protection in place.

[fol. 696] According to the specifications, the two types of tunnel protection are for different purposes as indicated in the specifications. It was not considered feasible by this office to use steel tunnel protection as close to the heading as may be required for the protection of the workmen while excavating and drilling without subjecting it to destructive damage, which was the objection to so using it.

If, in the use of steel tunnel protection in lieu of temporary protection, any steel members are damaged which delay the work, no additional time will be allowed for such delays.

13. On January 10, 1947, the defendant's resident engineer sent the following letter to the plaintiff:

This letter will serve to confirm the discussion relative to tunnel protection attended by Mr. Peter Bianchi, President of Carlo Bianchi & Co., Inc., Mr. E. Diehl of the Cabot Construction Co., Tunnel Sub-Contractor, and Messrs. D. A. Losey and D. E. Mather of the Government Inspection Force. This conference was held in the Resident Engineer's Office, Thursday afternoon, 9 January 1947.

At this time it was understood and agreed that as stipulated in Par. TP4-03, *Tunnel Protection, a. Scope,* that the steel tunnel protection as defined in this paragraph, would not be placed beyond the first 50 feet of the outlet end of the tunnel including the transition section, or to approximate station 27+10.

That from this station 27+10 to 21+00 approximately, temporary tunnel protection as indicated in Par. TP4-02, *Tunnel Excavation, a. Scope*, is to be used. Mr. E. Diehl's request to use steel ribs and timber lagging for this purpose is in accordance with the specifications, and therefore permissible, provided the outside edge of the steel ribs are set so as not to be inside the outside neat line of the concrete tunnel lining, and as much of the timber lagging is removed just prior to concreting as is consistent with safe working conditions. The expense is to be borne by the contractor. The material use for such temporary protection is optional as long as it furnishes adequate protection.

14. Except for the steel arch ribs and liner plates referred to above, the Cabot firm drilled the tunnel with no protection overhead except that which was provided by careful inspection of the roof as the drilling rig entered the tunnel in the morning and left in the afternoon. [fol. 697] The roof was examined and rock which seemed loose was removed with scaling bars.

15. The tunnel was "holed through" by March 12, 1947. Cleanup work commenced immediately by the Cabot firm but there were rockfalls after the cleanup crew had removed loose rock from the floor of the tunnel. For the first 200 feet, the cleanup crew returned to remove rock which had fallen after they had performed the cleanup operations but the rockfalls were so extensive that for the remaining 510 feet of tunnel there was only one cleanup without return for further cleanup. The cleanup crew finished its work on March 25, 1947.

16. Because of the rockfall experienced during the tunnel driving operations, Mr. Diehl and Mr. Dunham of the Cabot firm requested the defendant's resident engineer, Mr. Mather, to authorize the installation of steel tunnel supports and liner plates throughout the length of the tunnel. They were told by Mr. Mather that such would not be authorized as a pay item unless there was an indication that the tunnel would cave in.

17. The assistant resident engineer, Mr. Dale Losey, testified that in light of the condition that existed at

Almond Tunnel in April or May 1947 with respect to rockfall, it would be necessary to install some protection before it would be possible to line the tunnel with concrete.

18. On April 10, 1947, the plaintiff sent the following letter to the defendant's resident engineer:

> The work involved in excavating the tunnel bore on this job has been completed, and it has been driven through.
>
> Permanent tunnel protection in the form of steel Liner Plates and Tunnel Supports has been installed for distances of 50 ft. at each end of the tunnel.
>
> The work of concrete lining the tunnel is scheduled for accomplishment early in the 1947 season.
>
> It is our opinion that, in recognition of the extremely hazardous conditions existing inside this tunnel, immediate consideration should be given to the provision of permanent tunnel protection throughout the entire length of the tunnel.
>
> Our workmen cannot be expected to carry on under these conditions, which would expose them to the ever-present risk of serious injury or even death from fall-
> [fol. 698] ing rock. It can be expected that they will refuse to enter the tunnel unless and until these hazards are eliminated.
>
> We suggest, therefore, that we be given immediate authorization to extend this permanent protection of steel supports and Liner Plates throughout the entire length of the tunnel, with compensation for same being made to us under the applicable Job Items No's. 11 and 12.

19. The assistant resident engineer on April 15, 1947, sent the following reply to the above-quoted letter:

> The receipt is hereby acknowledged of your letter dated 10 April 1947 relative to tunnel protection.
>
> My position in regard to your request for extending contract items 11 and 12 (Permanent Tunnel Lining) to protect the tunnel bore between Stas. 21+00 and 27+10.5, which is in addition to 50 feet steel lining including the outlet transition stipulated

for each end of the tunnel, is the same as stated in my letter to your company dated 10 January 1947, subject: Temporary Tunnel Protection. That letter confirmed the approval at a conference on 9 January 1947, in which Mr. E. F. Diehl, Vice President of the Cabot Construction Co., proposed the use of steel ribs and timber lagging for temporary protection in accordance with Paragraph TP4-02. *Tunnel Excavation. a. Scope.* On 14 January 1947 you were advised orally that your tunnel sub-contractor was using for temporary protection upstream from Sta. 27+10.5, steel ribs purchased for Item 12, and you were advised that their use in temporary protection would be approved provided such use was confirmed in writing. This was done in a letter dated 14 January 1947 signed by Mr. T. A. Coyne. This is evidence of a clear understanding that the section of the tunnel between Stas. 21+00 and 27+10.5, that temporary tunnel protection for the safety of workmen was to be used in accordance with the applicable specifications.

The fact that your sub-contractor was able to drive the tunnel through the section in question safely without placing such temporary protection does not in any way relieve you of your responsibility for protection of the work and workmen during the operations required for placing the concrete tunnel lining.

In reference to the fifth paragraph of your letter as required by the specifications you are responsible for the safety of all workmen on your contract and shall provide during construction at your own expense adequate safety protection for them and the
[fol. 699] work involved. Therefore, the further procurement and placing of contract items 11 and 12 are not authorized.

For the Resident Engineer:

20. On April 23, 1947, the plaintiff sent the following letter to the resident engineer with a copy to Colonel J. S. Seybold, District Engineer, Baltimore, Maryland:

Re: *Permanent Tunnel Protection*

We have received a letter dated April 15, 1947, from Mr. Dale A. Losey, Assistant Resident Engineer, in reply to ours of April 10, 1947, on the above subject.

We wish to point out that the request contained in our letter of April 10 does not concern itself with the matter of temporary tunnel protection; it is concerned wholly with the permanent type of tunnel protection as described in the contract specifications paragraph TP4-03.

The specifications clearly indicate that the Government intended installation of permanent steel supports and liner plates to a distance of 50 feet in from each end of the tunnel and for such additional distance as conditions would require.

Ever since the start of rock excavation work on this project, and even prior to the time when the actual tunnel excavation was started, the question of the character of the rock that would be encountered in the tunnel has been the subject of discussions with the Resident Engineer and his staff. These discussions were participated in by our subcontractor, Cabot Construction Corporation, as well as ourselves. We consistently maintained the position that the character of the rock within the tunnel was such that provisions should be made for permanent tunnel protection. The Resident Engineer took the position that the permanent tunnel protection would be authorized only for 50 feet from each end.

In view of the position taken by the Government, the subcontractor was required to proceed with the excavation of the tunnel without the installation of permanent tunnel protection, employing temporary tunnel protection of its own devising in order to afford the necessary protection for its workmen.

As a result of the failure of the Government to authorize the installation of permanent tunnel protection during the progress of excavation, there have now developed large areas where the tunnel roof has disintegrated or failed, and there are piles of dislocated material on the floor of the tunnel.

[fol. 700] In view of the now known facts with reference to the dislodgment or failure of large areas of the tunnel roof, a condition which could have been anticipated and prevented had the Government acceded to our request for permanent tunnel protection, we now again request that the Government authorize the installation of the permanent tunnel protection, together with the necessary and obvious corrective measures incidental thereto, at the Government's expense.

May we have the courtesy of a prompt reply granting to us the above-requested authorization?

21. The leter of transmittal to Colonel Seybold of the copy referred to above, bearing the same date, is quoted below:

> We are enclosing for your consideration and record a copy of a letter which we have today addressed to Mr. D. E. Mather, Resident Engineer. The subject matter involved is of vital importance to the orderly progression of this project. It is not our desire to engage in controversies with the Government, but we feel very strongly that the conditions now existing could have been avoided had we been granted the authority we requested.

22. On May 5, 1947, Colonel Seybold sent the following letter to the plaintiff by registered mail:

> Reference is made to your contract number W-30-180-eng.-397, providing for construction of Almond Dam at Almond, New York, and to your letter dated 23 April 1947 inclosing for my consideration your letter of even date addressed to my Resident Engineer requesting an authorization to place at contract prices additional permanent protection in the tunnel.
>
> I have caused an examination to be made of the contract documents and the circumstances and events that have preceded your request and I have found as follows:
>
> a. Contract drawing sheet No. 7 shows foundation exploration data that indicates the type and character

of the material that would be encountered during the tunnel driving and lining operation.

b. Paragraph SC-7a of the specifications notified all parties interested in this project that samples of the materials removed from the foundation exploration holes were available for inspection at the U.S. Engineer Soils Laboratory at Ithaca, New York.

c. Paragraph GC-3 of the specifications annotated for the information of prospective bidders, certain [fol. 701] items of consequence with respect to site and job conditions. Your acceptance of the contract indicates that you have satisfied yourself as to these conditions including subsurface conditions.

d. Contract drawing sheet No. 24 clearly indicates tunnel protection 50 feet back from the face of each portal of the tunnel.

e. Paragraphs TP 4-03(a) and (c) of the specifications also describes and indicates the limits of tunnel protection "as required for distances of approximately 50 feet at each end of the tunnel." This limitation to hold unless directed otherwise.

f. Paragraph TP 4-02 of the specifications contains a statement that "temporary tunnel protection shall be provided where required for safety of the workman."

Under the terms of the contractual requirements cited above, I consider that the Government clearly and in a very exact manner indicated the extent to which the Government would require and assume payment for permanent tunnel lining. I also consider that sufficient data was available for you to make a proper consideration of the tunnel protection which would be necessary for you to install in order to provide adequate protection against damage to completed work as well as the safety of your workmen.

A review of the records of my Resident Engineer indicates that he consulted with your representative prior to the commencement of the tunnel work and advised you fully and correctly as to the extent of both the Government's responsibility and your responsibility in placing tunnel lining beyond the limits required and indicated for payment.

Interim correspondence indicates that you were periodically aware of the gradual deterioration of the rock in the tunnel which did not commence until the tunnel was completely holed out, yet you apparently took no action to protect either yourself or the interest of the Government.

It is my decision, in view of the above finding, that no further tunnel lining will be placed at the expense of the Government. Furthermore, my Resident Forces will be instructed to require that adequate precautions be taken to insure the safety of all personnel when your tunnel operations are resumed.

If you wish to appeal my decision in the matter, you are advised of your rights of appeal within 30 days from date of receipt of this letter as provided under the terms of Article 15 of the contract.

[fol. 702] 23. The plaintiff on May 29, 1947, filed a timely appeal from the contracting officer's decision.

24. On May 26, 1947, following a conference at Baltimore with Colonel Seybold and his staff, the plaintiff wrote the following letter to the contracting officer:

Reference is made to the letter which we addressed to your Resident Engineer on April 23, 1947, and to your reply dated May 5, 1947 (File #NABVK).

On the occasion of our recent conference with you and members of your staff at Baltimore on May 12, we pointed out the importance of proceeding with the installation of the tunnel lining, and therefore requested that the Contracting Officer give us an indication of the type and character of permanent tunnel protection so that we could place orders for the materials. In response to our request the Contracting Officer directed that we submit for approval a description of the tunnel protection which we would recommend.

After careful consideration, and consultation with Cabot Construction Corporation, our subcontractor on the tunnel work, and with our Consulting Engineer, Mr. Miles N. Clair, Vice President, The Thompson & Lichtner & Co., Inc., Boston, Mass., and with

Mr. F. J. Crandell of Liberty Mutual Insurance Company, Boston, we are of the opinion that the minimum permanent tunnel protection which we believe will meet the requirements of the situation adequately, and for which we request the approval of the Contracting Officer is the use of the same ribs and liner plates as were used in the installation at the portals, for the entire length of the tunnel.

Due to the fact that this is a situation requiring immediate attention and decision on the part of all concerned, we earnestly suggest that you give the subject your immediate attention and inform us promptly whether or not the above proposed type of tunnel protection is approved.

In taking these steps to assure progress of the work in the interest of the government, we do not waive any rights related to the appeal we are taking to the ruling contained in your letter of May [5], 1947.

25. On June 13, 1947, the contracting officer sent the plaintiff the following letter:

Reference is made to your letter dated 26 May 1947 wherein you submit a proposal for the safe protection of your workmen in the tunnel at Almond Dam under your Contract No. W-30-180-eng-397.

[fol. 704] Your request refers to "Permanent Tunnel Protection". You are advised that no permanent tunnel protection will be required to be installed in Almond Dam Tunnel in addition to that protection already installed and paid for under contract payment items numbers 11 and 12. Also, you are advised that "Permanent Tunnel Protection" required under this contract is at the portals only and is protection designed to withstand earth pressures.

Temporary tunnel protection as required under the provisions of paragraph TP4-02 of the contract specifications is temporary in that its only function is to support a falling rock load and prevent injury to your workmen. The greatest load to which it will be subjected will be the dead load of the back packed materials.

In paragraph 3 of your letter, you state that you are of the opinion that the minimum permanent tunnel protection that will meet the requirements of the situation adequately and for which you request approval are the same ribs and liner plates used at the portals. If you desire to use this design of tunnel protection throughout the tunnel length, its use is approved. You are advised, however, that this type of installation is considered as an over design for the purpose required and will be a more costly installation to you than is considered necessary.

It is suggested and recommended to you that adequate temporary protection may be obtained by using I beam ribs of about 3 inches and 6 pound weight spaced 4 to 8 feet apart (depending on the overbreak) with 2" timber lagging. The void area in the arch would then be uniformly packed with shale or bank run gravel in a manner to insure a uniform load distribution. Protection of this kind will be adequate to support the falling rock load as well as the material used in back packing. Favorable consideration will be given to a proposal of comparable design.

It might be called to your attention that a scheme similar to the above was proposed to my Resident Engineer by a representative of your subcontractor, the Cabot Construction Company, at the time tunnel excavation was commenced.

It is to be understood that the contents of this letter are not to be construed as a reversal of my decision to you dated 5 May 1947 to the effect that no payment would be made by the Government for the additional tunnel protection required to complete work under your contract.

[fol. 705] 26. In the meantime, the plaintiff had requested advice from F. J. Crandall, Assistant Vice President of the Liberty Mutual Insurance Company, and Chief Engineer of its Loss Prevention Department. This firm was the plaintiff's carrier as to workmen's compensation, liability and property damage insurance. Mr. Crandell was an engineer of over 30 years' experience whose specialty was roof control in tunnel work. Crandell inspected

the tunnel on April 14, 1947 for the purpose of determining the safety of the roof condition in the Almond Tunnel and whether or not the conditions required the timbering of the roof section. He entered the tunnel from each end and observed the conditions existing for a distance of 200 feet from each end. He did not see the center 300 feet of the tunnel. On April 18, 1947 he sent an eight page report of his findings and conclusions to the plaintiff. The letter of transmittal is quoted below:

> Attached you will find my report regarding the roof conditions in the Diversion Tunnel of the Almond Dam.
>
> In addition to the conclusions drawn from this investigation that are incorporated in the report, I wish to mention at this time that the installation of the braces, in the Diversion Tunnel, that will be necessary will, no doubt, be a dangerous operation.
>
> The length of time that the tunnel has been unsupported has brought the roof into a treacherous condition, and therefore I believe it advisable to study in detail the method that you intend to follow in installing the supports in the tunnel. An actual recording of the step by step procedure that will be necessary, would allow both your organization and ours to study the operation in an endeavor to predetermine the accident causes that will exist and therefore be able to determine what should be done for the protection of the workmen during this operation.
>
> We would deem it an opportunity to work with your operating personnel in the laying out and analyzing of their design methods for the installation of the braces in order to assure the greatest safety for this dangerous phase of the operation.

Crandell found upon his inspection and examination that the type of rock encountered in the excavation was primarily shale which showed very thin horizontal bedding layers with fractures at an angle to the bedding planes. [fol. 706] The interior which he examined showed bedding planes of 2- to 6-inch thickness, while at the portals

they were microscopic in size. He also found that there had been numerous failures of the roof of the tunnel and that the floor of the tunnel (where he had made his observations) was covered with fallen rock for a depth of 2 to 5 feet. Crandell's conclusions in his report to the plaintiff are quoted below:

Conclusion:

It is my opinion that the roof of this diversion tunnel is so unstable that if left to itself failure will continue to occur and large voids will eventually show themselves in the roof of the tunnel. These voids, in all probability will take the shape of a triangle whose base will be the width of the existing bore and the two legs will be at an angle of approximately 80° with the horizontal.

Because of the low modulus of elasticity being approximately three million pounds per square inch, this material will deflect ten times as much as steel will, and in the process of this continuous deflection, microscopic fractures will occur that decreases the strength of the shape.

This tunnel is extremely unsafe and no further operations should be performed unless the roof is supported from portal to portal.

The strength of the shale in these thin bedded areas probably averages between two and four hundred pounds per square inch in tension, and the supports therefore should be approximately four feet center to center.

A large amount of scaling is necessary at the intake portal to insure the safety of further operations. All fault sections and frost heave areas should be barred down and continual scaling be performed throughout the operation.

The portal supports on the intake section of the tunnel should be extended at least ten feet outside of the tunnel in order to afford protection against falling rock from the hillside.

During the winter months, due to the low temperatures, this shale contracted. As the tempera-

tures of spring and summertime increase, there will be a large amount of expansion in the rock. This expansion will throw stress into the rock that will produce small fractures and will continually weaken the structure. Because of this expansion medium in the rock, we can look for greater falls than have already occurred, if the condition is allowed to continue without supports.

[fol. 707] In order to assure no tremendous dome failures it is important that the rock in this tunnel be supported as soon as possible and thus stop the movement of the rock that is now continuing.

27. Other letters were exchanged between the parties, and on July 25 the plaintiff wrote stating that it had considered the design of tunnel protection recommended by the contracting officer, and called temporary protection by him, and that it had been advised by its consultants, and the Liberty Mutual Insurance Company, that the design was inadequate. The plaintiff then proceeded to outline a design of steel tunnel protection with which it felt that it could safely proceed, being 4-inch steel ribs, 13 pounds per foot, spaced 4 feet apart, with ⅛-inch liner plates above the ribs. Approval of this design was therein requested.

28. On August 11, 1947, the acting district engineer sent the following letter to the plaintiff:

> Reference is made to your letters dated 25 July 1947 and 1 August 1947 relative to the temporary tunnel protection which you propose to install under your Contract Number W-30-180-eng-397 which provides for the construction of Almond Dam at Almond Dam, New York.
>
> By letter dated 5 May 1947 you were furnished a decision by Colonel J. S. Seybold, then District Engineer, to the effect that the tunnel protection remaining under your contract would consist of temporary protection placed in accordance with paragraph TP 4-02 of the contract specifications as a safety precaution for the workmen at no additional cost to the

Government. You have appealed this decision of the District Engineer in accordance with the terms of the contract. Subsequent to your appeal you had offered for approval a proposed plan of protection, the merits and necessity of which were clearly discussed in a letter to you from the District Engineer dated 13 June 1947.

Your letter dated 25 July 1947 outlines again the plan of protection which you are electing to use. You also express your views with respect to probable differences in cost between your proposed plan and the scheme suggested by this office as adequate. Your letter cites the interests of the Government in the matter as an extra and infers a liability for costs on the part of the Government. It becomes necessary, therefore, to advise you that the decision of the District Engineer and your subsequent appeal will be reviewed and a final decision rendered by higher
[fol. 708] authority as soon as an orderly processing of your appeal can be accomplished. In the meantime, severe inexcusable delays to the work are resulting from your failure to proceed and it is not believed that your interests will be furthered by continuing correspondence on the matter.

The Government position has been made clear in the previous correspondence and is summarized briefly as follows:

a. In accordance with paragraph TP 4-02 of the contract specifications "temporary tunnel protection shall be provided where required for safety of the workmen". The installation of this temporary protection is not structurally necessary to insure the safety of the completed tunnel structure and need be designed only to support a falling stone load and backfilled material in the tunnel overbreak area. The design suggested by this office is considered adequate for that purpose and will be approved for use if you wish to reconsider our plan. However, since the safety of your workmen is your responsibility you must, of course, provide a protection which you con-

sider adequate for their safety, therefore, no objection will be made to the protection plan which you propose to use. Under the terms of the contract all costs will be accrued to you unless found otherwise by higher authority.

29. The plaintiff, on August 15, advised the contracting officer, via the resident engineer, that its consultants had recommended to it that the problem of tunnel protection should be referred to an eminent and nationally known authority for special study and that this had been done, and that such authority had concurred in plaintiff's view that the district engineer's recommendation concerning such tunnel protection was inadequate.

30. Mr. Miles N. Clair, a consulting civil enginer with wide experience in tunnel work examined the Almond Tunnel on May 1, 1947. His examination covered the entire tunnel from the inlet portal to the outlet portal downstream. He observed dripping water from the numerous silt or clay joints in the tunnel roof, substantial rockfalls on the floor of the tunnel and that the roof was flat in the areas where rock had fallen leaving triangular shaped areas 3 or 4 feet deep. It was his opinion that these flat roof sections were potential locations for additional falls and that the roof was very unstable. He [fol. 709] found that this condition existed on May 1, 1947, also on August 7, 1947, when he again examined the tunnel. He recommended to the plaintiff that it should not proceed with the concrete lining of the tunnel unless supports were installed equal in supporting value to the permanent tunnel protection already installed at the inlet and outlet portals. Mr. Clair advised the plaintiff that the proposed protection suggested by the contracting officer in his letter of June 13, 1947 was not sufficient and would be inadequate.

31. Mr. Leslie F. Worsell, a senior mine and tunnel inspector in the Division of Industrial Safety Service, Bureau of Mines, Tunnels, Quarries and Explosives for the State Labor Department, New York State, inspected the Almond Dam Tunnel on April 25, 1947. He was accompanied on his inspection by Elford H. Richardson, Chief Engineer for the plaintiff and an engineer from the

resident engineer's office. The state inspector examined the tunnel from both ends but due to falling rock was not able to go completely through the tunnel. His reason for not going all the way through the tunnel was due to the danger from the roof falling. As as result of his inspection, he informed the resident engineer that he was going to issue a State Order which would prohibit anyone from entering the tunnel except those who would erect supports to make the tunnel safe. The resident engineer stated to the state inspector that to put steel protection in the tunnel would cost $50,000 and if he authorized this installation he might end up in Leavenworth. The state inspector recommended the installation of steel ribs and wooden lagging or steel linerplates and stated that such installation would be permanent tunnel protection because it could not be removed before concreting and would be embedded in the concrete.

The State Order was directed to the plaintiff on May 5, 1947 and reads as follows:

APRIL 30, 1947.

You are hereby directed to comply with the following requirements of Chap. 50, Laws of 1921, as amended.

Tunnel located Almond Dam Project—3 miles of Hornell, Water diversion Tunnel, County Steuben of which you are the constructor:

[fol. 710] 1. Immediately erect and maintain adequate timber or steel to control roof and rib falls of rock in tunnel. Code Rule 1372—Bulletin 25.

2. Permit no one in the tunnel until this timbering has been done, except men engaged in erection of same.

RECOMMENDATION: Steel ribs supporting either 2" l[a]gging or steel plates.

The above requirements must be complied with IMMEDIATELY, unless otherwise specified herein. Address communications to Bureau of Mines, Tun-

nels, Quarries and Explosives, State Office Building, Albany, N.Y.

INDUSTRIAL COMMISSIONER

May 5, 1947

32. Subsequent to June 23, 1947, the plaintiff engaged an emirent consulting mining engineer, former Chairman of the Mining Methods Committee of the American Institute of Mining and Metallurgical Engineers, Mr. J. Murray Riddell, to inspect and study the Almond Tunnel and to determine the nature of protection required before concreting. Mr. Riddell had extensive experience as a mining engineer in connection with underground operations, particularly in rock structure tunnels, and is Professor of the Department of Mining, College of Mining and Technology, Houghton, Michigan. He examined the Almond Tunnel. His findings were as follows: The rock in the tunnel consisted primarily of shale with a very limited amount of thin bedded sandstone. The structure was very nearly horizontal and badly weathered. The mass was fractured by the joint planes. There was some fracturing along the bedding planes horizontally. The joint planes, which were irregular in many instances, were filled with seams of mud or mud coating. Their angle of intersection one to the other varied between 60° and 90°. Water was dripping from the top of the tunnel in a great number of places. The sides of the tunnel were what he termed as weakened. There was evidence of rock failures from the roof. There was no adhesion in the fractures of the rock other than the mud or coating of mud, and this was very poor. There was also water seepage in the fractures from the roof structure and on the sides of the tunnel. Throughout the tunnel there had been failure of the roof, the amount of rockfall varying in different places. He found that the roof of the tunnel in mining terms would be classified as a [fol. 711] rotten top and that throughout the tunnel the roof was in an unstable condition. Mr. Riddell was of the opinion that the Almond Tunnel required permanent tunnel protection before concreting and recommended that the entire tunnel be lined with steel sets.

33. Plaintiff proceeded to install the steel ribs and liner plates throughout the tunnel and completed such installation between mid-August and mid-October, 1947, following which plaintiff proceeded to complete the installation of the backpacking above the linerplates, and the cleanup of the floor of the tunnel in preparation for the concrete work. Following the installation of the ribs and liner plates and the backpacking, it was necessary to do a completely new job of cleaning out the invert of the tunnel. After the cleanup of the tunnel in March, 1947, subsequent rockfalls occurred and the work of the machinery such as crawler tractors and trucks and other types of equipment going back and forth through the tunnel and the spillage of material used in backpacking, caused the floor of the tunnel to disintegrate to a certain extent. All of such loose material had to be removed and the invert washed down before the concrete could be placed. Plaintiff, knowing that it would be necessary to concrete during the winter months, was required to and did prepare its concrete batching plant for winter work which required completely enclosing the plants, putting in a couple of steam boilers, piping, making installations to protect the materials before they were incorporated in the concrete, and also making provision to protect the areas after the concrete had been poured. The work described was done between mid-October and December 15. Plaintiff commenced the concreting of the Almond Tunnel on December 15, 1947, and completed it on May 8, 1948.

34. The formation and nature of the rock structure of the Almond Dam Tunnel, the logs of the borings and the drawings, were studied and investigated by numerous witnesses appearing both for the plaintiff and the defendant. They included geologists, consulting engineers and engineering representatives of both plaintiff and defendant. From the testimony of these witnesses it is apparent that vertical intersecting fractures containing mud or clay seams were found throughout the tunnel.

[fol. 712] 35. The vertical intersecting fractures containing clay or mud seams were the basic cause of the rockfalls throughout the tunnel. The vertical intersecting fractures divided the rock into vertical columns. The bed-

ding planes were planes of weakness, not open fractures, dividing the rock into blocks or slabs. Mud was washed down from above in many of the joint cracks. When the tunnel was holed through the support of the columns of rock was removed and they were supported only by friction along the fractures, and as a result many blocks and slabs fell immediately after the tunnel excavation was completed. The weather reports for the area of the tunnel clearly show that precipitation for the months of March and April 1947 was very substantial, the total precipitation for April being 5.5 inches. This resulted in the ground being saturated and the mud in the fractures being saturated and with water seepage working through the fractures acting as a lubricant, washing the mud seams out, caused many blocks of rock to fall.

The excavating of the tunnel took place during the winter months—December through March and during this period the ground above the tunnel was frozen and the water was frozen so that the cracks did not loosen up through the mud seams. This accounted for the smallness of the rockfalls during the excavation period. The bad falls took place in the spring. These falls indicated that the tunnel roof was not stable.

36. Another indication of the instability of the Almond Tunnel was its change in excavated shape during the period from the holing through on March 12, 1947, to the time the plaintiff installed steel ribs and liner plates. The rockfalls during this period changed the tunnel shape on the roof, haunches and invert. These changes are apparent from the cross sections of the tunnel taken by the plaintiff's engineers shortly after the holing through and at later dates before the installation of steel ribs and liner plates, thus affording a comparison of the rockfall over a period from the spring of 1947 until the fall of 1947. These cross sections taken at 10-foot intervals of the tunnel consisting of 13 sheets were examined by the plaintiff's witnesses and by the defendant's resident engineer.

[fol. 713] The evidence establishes that, as indicated in plaintiff's exhibit 52, there were many places of flat roof where large slabs of rock had fallen out and that these

large blocks of rock having fallen out left an irregular roof with much overbreakage beyond the intended line, and that this condition existed practically throughout the tunnel. These conditions indicated that the roof was unstable between stations 21+00 and 27+10.

The resident engineer from his examination of plaintiff's exhibit 52 admitted that the Almond Tunnel had changed its shape from the time of excavation to October 1947. The assistant resident engineer of the defendant admitted from his examination of plaintiff's exhibit 52 that there was a change in the invert shape at various stations and that at certain stations the rockfalls were substantial, resulting in a change in the perimeter of the tunnel.

37. Another indication of the instability of the roof structure was the fact that it would not corbel and arch well. Normally in a shale formation a rockfall from the roof would have a natural tendency to corbel itself and form an arch. This did not occur however, in the Almond Tunnel where rock fell leaving a flat roof, thus indicating that it would not corbel and arch well. The flat roof sections were potential locations for additional falls.

38. The specifications and the logs of the borings indicate that for the first 50 feet in from the portals it would be expected that weathered rock would be found. Beyond that distance the logs of the borings and the drawings containing the descriptive legends indicate that unweathered rock would be expected to be found in the tunnel interior. The plaintiff's consulting engineer, Mr. J. Murray Riddell, had prepared under his supervision plaintiff's exhibit 116, based upon his investigation and observation of the Almond Tunnel, including the drawings, logs of the borings and specifications. This exhibit is a drawing of the tunnel profile showing the various tunnel drill-holes and whether the rock expected to be found in the area of each tunnel drill-hole was weathered or unweathered based upon the designations in the logs of the borings contained in plaintiff's exhibit 4-B.

The distinction between weathered and unweathered [fol. 714] shale lies in the difference of the fractures and the presence or non-presence of mud seams in the frac-

tures. Weathered rock was fractures and mud seams whereas unweathered rock may have fractures but joint fractures would be a minor exception and would not contain clay or mud seams.

The specifications prepared by the defendant's engineers were predicted upon the information contained on the drawings including the drill hole legends of weathered and unweathered rock. From this information supplied the plaintiff the defendant represented that the plaintiff could expect that rock of an unweathered nature would be found throughout the tunnel beyond the 50 feet at the portals. Drill Holes Nos. 13, 31, 32, 33, 57, and 59 indicated unweathered rock in this area. Such rock if unweathered as indicated in the drill holes referred to would be structurally sound and would not contain vertical intersecting fractures containing clay or mud seams such as were found in this tunnel area.

The defendant's geologist testified that the logs of the cores shown in the drawings at Almond Tunnel were inserted to apprise the contractor as to the sub-surface conditions and admitted that when the logs of the borings show weathered and unweathered rock a contractor should be reasonably entitled to believe that the logs are correct and that unweathered rock would be found where shown.

39. It is clear from the evidence that the conc eting operation in the tunnel could only be accomplished by supporting in some manner the roof of the entire tunnel during the concreting to insure that portions of the roof would not fall into the wet concrete. This was admitted by the defendant's resident engineer and his assistant.

40. The defendant's witnesses drew a distinction between temporary and permanent tunnel protection as to the objective to be accomplished. They say that temporary protection is used to protect workmen and it is still regarded by them as temporary though it is embedded forever in concrete. As to permanent protection, it is used only to preserve the shape of the tunnel.

41. Prior to the performance of the work under the contract in suit, the defendant had had The Arkport Dam and Diversion Tunnel constructed at a location about four

miles from the Almond Tunnel. The rock in the tunnel [fol. 715] at Arkport contained more sandstone which is stronger than the shale at the Almond Dam. The bore was 8 feet in diameter (finished bore after concreting). In the contract for the construction of the Arkport Dam and Diversion Tunnel, the defendant specified that tunnel protection in the form of steel ribs and 2-inch wood lagging would be placed if in the opinion of the contracting officer there was need for such protection. The need at Arkport must have manifested itself and the contracting officer so opined because such tunnel protection was installed throughout that tunnel. Mr. Mather was the defendant's resident engineer for both the Arkport and Almond jobs but despite the larger bore, poorer rock and shale at Almond, he withheld a recommendation for the installation of steel supports for the center 610 feet of the Almond Tunnel.

42. Plaintiff prepared its bid on the basis that the subsurface conditions in the Almond Tunnel after excavation would be such that the roof of the tunnel would be sufficiently stable to permit plaintiff to concrete-line the tunnel without the necessity of first installing permanent tunnel protection beyond the 50 feet at the portals. The defendant accepted the bid on that basis. The vertical intersecting fractures containing clay or mud seams found in the tunnel and the resulting rockfalls after the holing through of the tunnel, making it impossible to concrete-line the tunnel without first installing permanent tunnel protection throughout the tunnel, constituted unknown conditions of an unusual nature differing materially from those which plaintiff was justified in believing did exist and from those ordinarily encountered.

43. The steel ribs installed by the plaintiff in the tunnel beyond the 50 feet at the portals which had to be left in place were embedded in the concrete within the neat line.

44. Plaintiff was ready to start the concrete lining of the tunnel by May 1, 1947 in accordance with its progress schedule and had all necessary plant and equipment available either at the job site or within ready access to the job site. The plaintiff did not have all of the equipment on

the job site because it was evident from the condition of the tunnel that it would be necessary to install permanent tunnel protection so that plaintiff would not have [fol. 716] been able to start concreting by May 1. Plaintiff realized that it would be unable to start any concrete work in the tunnel until after permanent tunnel protection had been erected. Plaintiff knew that effecting delivery of the supports after obtaining approval for their installation and the work of installing them would take several months.

The resident engineer admitted that if the plaintiff had had all of the concreting equipment on the job in April 1947, the plaintiff could not have used it, because the plaintiff could not concrete-line the tunnel without first putting in protection, which he termed temporary.

45. The acting district engineer, on February 10, 1948, transmitted to the Chief of Engineers, U. S. Army via the Division Engineer, North Atlantic Division at New York, the contracting officer's findings of fact, the contractor's appeal, contractor's comments, and his own comments, which contained a recommendation that the contracting officer's decision be upheld and that the claim for an extra payment be denied. Following the above recommendation, the acting district engineer (who was acting for the contracting officer) said in his letter of transmittal:

* * * * *

> 7. If the appeal is sustained, the contractor would be entitled to payment from the Appropriation 21x3113 Flood Control, General in the amount of approximately $9,000.00, i. e., if paid similar to payment under terms 11 and 12, and would open the possibility for additional claims for overbreak and contingent items throughout the tunnel. This is a continuing contract and funds have not been made available for payment of the instant claim.

* * * * *

46. On March 17, 1948, the Division Engineer by endorsement to the material mentioned in the preceding finding, sent it on to the Chief of Engineers concurring in the recommendation of the District Engineer. His

endorsement began "This appeal, involving approximately $9,000.00 * * *." That figure had been mentioned no where except in the quoted portion of the preceding finding.

47. The Corps of Engineers Claims and Appeal Board on June 17, 1948 held a hearing on the plaintiff's appeal. [fol. 717] Witnesses were heard on behalf of the plaintiff and the Government.

48. On December 14, 1948, the plaintiff was notified of the adverse action by the Corps of Engineers Claims and Appeal Board, and the Chief of Engineers upon the plaintiff's appeal.

49. From all the evidence of record, it is found that the failure and refusal of the resident engineer to recommend and of the contracting officer to direct the installation of steel arch ribs and liner plates caused a disruption of the sequences of operations, as well as delay in the performance of the work by the plaintiff. It required that concreting operations, which the plaintiff could, and would have performed in warm weather, be accomplished in winter weather with resulting loss of efficiency.

50. The finding as to the extent of such delay is reserved for later determination.

Conclusion of Law

Upon the foregoing findings of fact, which are made a part of the judgment herein, the court concludes as a matter of law that plaintiff is entitled to recover and judgment will be entered to that effect. The amount of recovery will be determined pursuant to Rule 38 (c).

[fol. 718] IN THE
UNITED STATES COURT OF CLAIMS

No. 466-54

* * * *

CARLO BIANCHI AND COMPANY, INC.

v.

THE UNITED STATES

William H. Matthews for plaintiff. *Robert W. Knox* and *Robert F. Bradford* were on the briefs.

Gerson B. Kramer, with whom was *Assistant Attorney General William H. Orrick, Jr.*, for defendant.

OPINION—May 19, 1962

PER CURIAM: In the court's opinion of January 14, 1959 (144 Ct. Cl. 500), it was decided that the plaintiff was entitled to an equitable adjustment for the cost of installing permanent supports in the tunnel, and the case was remanded to the Trial Commissioner pursuant to Rule 38(c) to determine the amount.

The Trial Commissioner has now reported that Items 2 through 7, both inclusive, and Item 16 were reasonably related to the cost of installing the tunnel supports and the damages for the delay incident thereto and as a result of the disruption to the balance of the contract work. The court agrees with the Trial Commissioner that the plaintiff is entitled to recover for such items, but the court is of the opinion that the plaintiff is also entitled to recover its profit on the cost of installing the permanent tunnel supports and the work incident thereto, which are Items 3, 4, 5 and 16 listed in finding 5 of the Commissioner's report.

In the plaintiff's original bid, which was accepted by defendant, there was included 15 percent profit before

[fol. 719] overhead, taxes and insurance. Plaintiff is entitled to the same profit on these items. With the addition of this profit, so computed, Items 3, 4, 5 and 16 amount to the following:

Item 3 (Finding 28)	$35,418.81
Item 4 (Finding 32)	33,432.39
Item 5 (Finding 34)	16,115.25
Item 16 (Finding 39)	3,243.54

The amount of recovery for Items 2, 6 and 7, as found by the Trial Commissioner and approved by the court, is as follows:

Item 2 (Finding 26)	$8,442.08
Item 6 (Finding 36)	37,189.29
Item 7 (Finding 38)	15,776.00

Items 2 to 7, both inclusive, and Item 16, as thus amended, amount to $149,617.36, which sum plaintiff is entitled to recover.

Plaintiff is not entitled to recover the additional items claimed in its amended petition filed March 9, 1959, for the reason that the additional items claimed therein have no relation to the cost of the installation of the permanent tunnel supports; nor is the plaintiff foreclosed from recovering on the items allowed above by reason of the execution of the release, this matter having been heretofore determined by the court in its opinion filed on January 14, 1959.

Judgment will be entered for plaintiff and against the defendant in the sum of $149,617.36.

It is so ordered.

Findings of Fact

The court, having considered the evidence, the report of Trial Commissioner William E. Day, and the briefs and argument of counsel, makes findings of fact as follows:

1. The plaintiff constructed an earthen dam and related works near Hornell, New York, pursuant to contract entered into between it and the United States, through the Army Engineer Corps as a flood control project. The

plaintiff was paid about three and one-half million dollars for the work, sustaining a net loss of $327,000.

2. This action was brought to recover "compensation for additional work done and reimbursement for the increased costs occasioned by Government delays and other [fol. 720] increased costs * * *" due to the failure on the part of the defendant to authorize permanent tunnel supports and liner plates in the tunnel which had been blasted through rock for a distance of 710 feet.

3. The original petition claimed damages totaling $259,721.87. This total was made up of the following items claimed:

Schedule of Plaintiff's Increased Costs

1. Cost of Removing Extra Overbreak During Original Tunnel Driving	$1,092.75
2. Cost of Removing Fallen Rock and Extra Rock to Invert Subsequent to Completion of Tunnel Driving (March 25, 1947)	9,018.00
3. Permanent Tunnel Supports Installed After March 25, 1947	29,354.51
4. Backpacking Installation	24,979.15
5. Additional Concrete Placed	11,200.00
6. Heating Costs—Winter Concrete	45,853.08
7. Loss of Efficiency—Winter Concrete	18,560.00
8. Excess Supervisory, Engineering and Administrative Labor—period 1-16-49 through 6-30-49	35,250.01
9. Cost of principal Items of Plant and Equipment used and Maintained on Contract after 1-16-49	58,118.25
	$233,425.75
(15% allowance for profit on items 1-8, incl.)	26,296.12
	$259,721.87

4. The case proceeded to trial on the issue of liability. On January 14, 1959, the court decided that the plaintiff was entitled to recover, with the amount of recovery to be determined pursuant to Rule 38(c). Finding 49 of the court reads as follows:

> From all the evidence of record, it is found that the failure and refusal of the resident engineer to recommend and of the contracting officer to direct the installation of steel arch ribs and liner plates

caused a disruption of the sequences of operations, as well as delay in the performance of the work by the plaintiff. It required that concreting operations, which the plaintiff could, and would have performed in warm weather, be accomplished in winter weather with resulting loss of efficiency.

5. On March 9, 1959, after leave granted by the court, the plaintiff filed its second amended petition which in- [fol. 721] creased the damages claimed to $680,066.01. This total was made up of the following items:

Schedule of Plaintiff's Increased Costs

1.	.....	
2.	Cost of Removing Fallen Rock and Extra Rock in Invert Subsequent to Completion of Tunnel Driving (March 25, 1947)	$8,442.08
3.	Permanent Tunnel Supports Installed After March 25, 1947	31,248.69
4.	Backpacking Installation	29,392.12
5.	Additional Concrete Placed	13,697.96
6.	Heating Costs—Winter Concrete	37,189.29
7.	Loss of Efficiency—Winter Concrete	15,776.00
8.	Excess Supervisory, Engineering and Administrative Labor—period 1-16-49 through 6-30-49	32,367.87
9.	Cost of Principal Items of Plant and Equipment used and Maintained on Contract after 1-16-49	49,400.51
10.	Stockpiling of Impervious Material From Spillway Excavation, and Later Re-excavating and Placing same in the Closure Section of the Dam Embankment	59,261.80
11.	Excess Costs of Maintaining and Operating Earth Handling Equipment in Construction of Dam Embankment	249,619.14
12.	Excess Costs of Supervisory and Engineering Personnel Employed in Construction of Dam Embankment	21,186.13
13.	Salary of Assistant Superintendent in Charge of Concrete and Structures May 1, 1947 to August 7, 1947 (during which period no concrete was poured) Plus Loss of his Efficiency During the Period August 7, 1947 to October 14, 1947	3,116.57
14.	Cost of Maintaining Equipment for Concrete Operations, Idle from May 1, 1947 to August 7, 1947; also Loss of Efficiency of such Equipment During the Period from August 7, 1947 to October 14, 1947	31,257.03

15. Loss of Efficiency—Winter Rock Excavation for the Spillway December 5, 1947 through April 15, 1948	14,315.89
16. Engineering Consultant's Services re Type of Permanent Tunnel Protection Required Prior to Concrete Lining	2,820.47
	$599,091.55
(15% allowance for profit on items 2-9 and 11-16 incl.)	80,974.46
	$680,066.01

[fol. 722] 6. After the performance of all the work and the acceptance thereof by the defendant, the 37th and final estimate was prepared by employees of the Corps of Engineers for signature by the appropriate officer of the plaintiff. It showed a balance due plaintiff of $12,-236.56. This was returned, signed by an officer of the plaintiff, together with a release executed on behalf of the plaintiff which provided in pertinent part as follows:

> Now, therefore, In consideration of final payment under such contract in the amount stipulated above, the undersigned Contractor hereby releases the United States of America, its officers and agents, from any and all claims and demands whatsoever arising under or by virtue of said contract, except as follows:
>
> > The contractor reserves its right to pursue further, through appropriate channels, the subject matter of the various claims presented to the Corps of Engineers Claims and Appeals Board and docketed before that Board as Appeal No. 14. The contractor also reserves the right to pursue its claim for damages arising out of the use or non-use of material from Borrow Area No. 3; and also its claim for anticipated profit by reason of the Government's action in eliminating from the contract the Riprap originally provided for placement in the Railroad Protection Embankment.
>
> Executed this 11th day of February, 1950.

Thereafter, on March 9, 1950, a check in the sum of $12,736.56 was issued by the defendant and paid to the plaintiff. This included a $500 amount which had been withheld on an earlier voucher.

7. On May 5, 1947, the contracting officer had sent to the plaintiff by registered letter his decision as to the installation of tunnel supports in the 610 feet of the tunnel which provided in pertinent part as follows:

> It is my decision, in view of the above findings, that no further tunnel lining will be placed at the expense of the Government. Furthermore, my Resident Forces will be instructed to require that adequate precautions be taken to insure the safety of all personnel when your tunnel operations are resumed.
>
> If you wish to appeal my decision in the matter, you are advised of your rights of appeal within 30 days from day of receipt of this letter as provided
[fol. 723] under the terms of Article 15 of the contract.

8. The plaintiff on May 29, 1947 appealed this decision of the contracting officer by addressing a registered letter to the Secretary of War in the following terms:

> In connection with the provisions of Article 15 of our contract with the War Department for the construction of Almond Dam, we herewith appeal from the decision of the District Engineer under date of 5 May 1947, wherein the District Engineer ruled that "no further tunnel lining will be placed at the expense of the Government".
>
> We respectfully request the opportunity to submit evidence and a brief in support of our appeal at the appropriate time.
>
> Will you kindly acknowledge receipt of this appeal?

9. The above appeal was docketed with the Corps of Engineers Appeal Board as Eng. C&A Board No. 14. After much documentary information was submitted and a hearing requested, a hearing was held on June 17, 1948 by the Board in Washington at which plaintiff was heard

by counsel and the testimony of its witnesses. In his opening statement to the Board, Charles A. McCarron, plaintiff's attorney, stated in pertinent part as follows:

> For the purpose of the record, I am Charles A. McCarron, counsel for appellant. Perhaps a brief statement, may it please the Board, of the position of the appellant may be helpful in following the evidence as we propose to present it. In many respects there are no substantial differences between the Government and the contractor on certain of the basic facts that will develop in this case. Mr. Fox has clearly stated the position of the appellant to this extent that the appellant has lined this entire tunnel with steel liner plates and appears before this Board asking in equity and good conscience that it be reimbursed by the Government for the installation of these steel liner plates which the contractor felt were absolutely necessary in order to line this tunnel and complete the tunnel job because of the character of the rock that was encountered in the course of boring this tunnel, rock which could not be determined by the information available on the contract drawings and cores that were taken by the Engineers prior to award of this contract. * * *

[fol. 724] 10. As may be seen from the cost of performing the work of constructing the Almond Dam, and its related works, it was a large undertaking. It required excavation of material of various kinds or classes from either borrow areas or cuts including rock and placement of such of the material as was suitable therefor into embankment. In round figures in excess of 2 million cubic yards of material were excavated (some of which was usuable and therefore wasted or thrown aside) and about one million six hundred thousand cubic yards of material were placed in embankment.

11. The contract provides in part as follows:

> ARTICLE 16. *Payments to contractor.*
>
> * * * * *

(d) Upon completion and acceptance of all work required hereunder, the amount due the Contractor under this contract will be paid upon the presentation of a properly executed and duly certified voucher therefor, after the Contractor shall have furnished the Government with a release, if required, of all claims against the Government arising under and by virtue of this contract, other than such claims, if any, as may be specifically excepted by the contractor from the operation of the release in stated amounts to be set forth therein.

* * * * *

12. The specifications provide in part as follows:

* * * * *

SW-2. *Principal Features.* The work to be performed includes the following principal features:

(1) Diversion and care of stream during construction.

(2) Construction of approximately 1,300 linear feet of earth dam.

(3) Construction of outlet works, consisting of intake structure and operating house, concrete-lined tunnel, stilling basin, and approach and outlet channels.

(4) Construction of saddle type spillway, consisting of concrete ogee spillway weir, a concrete-lined apron, and approach and outlet channels.

(5) Construction of steel service bridge.

(6) Construction of railroad protection embankment.

(7) Relocation of railroad except ballast and track work.

(8) Relocation of highway including embankment, temporary gravel surfacing, guard rail and guide posts.

(9) Construction of gravel-surfaced access road.

[fol. 725] (10) Construction of lighting and power system.

(11) Installation of materials and equipment furnished by the Government.

The above general outline of principal features does not in any way limit the responsibility of the Contractor to perform all work and furnish all plant, labor and materials required by the specifications and the plans and drawings referred to therein.

* * * * *

GC-5. *Progress Charts, and Requirements for Sunday, Holiday and Night Work.* *a.* The Contractor shall within five days or within such time as determined by the Contracting Officer, after date of commencement of work, prepare and submit to the Contracting Officer for approval a practicable schedule, showing the order in which the Contractor proposes to carry on the work, the date on which he will start the several salient features (including procurement of materials, plant and equipment) and the contemplated dates for completing the same. The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion at any time. The Contractor shall enter on the chart the actual progress at the end of each week or at such intervals as directed by the Contracting Officer, and shall immediately deliver to the Contracting Officer three copies thereof.

b. The Contractor shall furnish sufficient forces, construction plant and equipment, and shall work such hours, including night shifts, overtime operations and Sunday and holiday work, as may be necessary to insure the prosecution of the work in accordance with the approved progress schedule. If, in the opinion of the Contracting Officer, the Contractor falls behind the progress schedule, the Contractor shall take such steps as may be necessary to improve his progress and the Contracting Officer may require him to increase the number of shifts, and/or overtime operations, days of work and/or the amount of construction plant, all without additional cost to the Government.

c. Failure of the Contractor to comply with the requirements of the Contracting Officer under this

provision shall be grounds for determination by the Contracting officer that the Contractor is not prosecuting the work with such diligence as will insure completion within the time specified. Upon such determination the Contracting Officer may terminate the Contractor's right to proceed with the work, or any
[fol. 726] separable part thereof, in accordance with the Delays-Damages Article of the contract.

* * * * *

GC-8. *Protection of Material and Work.* The Contractor shall at all times protect and preserve all materials, supplies and equipment of every description (including property which may be Government-furnished or owned) and all work performed. All reasonable requests of the Contracting Officer to inclose or specially protect such property shall be complied with. If, as determined by the Contracting Officer, material, equipment, supplies and work performed are not adequately protected by the Contractor such property may be protected by the Government and the cost thereof may be charged to the Contractor or deducted from any payments due to him.

* * * * *

SPECIAL CONDITIONS

SC-1. *Commencement, Prosecution and Completion.* *a.* The Contractor will be required to commence work under this contract within 10 calendar days after the date of receipt by him of notice to proceed, to prosecute said work with faithfulness and energy, and to complete the entire work ready for use not later than 900 calendar days after the date of receipt by him of notice to proceed. The time stated for completion shall include final clean-up of the premises.

b. The specified time for completion of the contract will be extended by the amount of time lost due to flooding of the work, when such flooding occurs as a result of the stream rising above and overtopping the upstream cofferdam provided it is built and maintained as specified in Section I of these specifications. No extension of time will be granted for

completion of the closure section of the dam embankment which shall be completed during the season in which it is started. (See subparagraph TP6-01*d*.) No extension of time will be made for flooding of the protected area after the time fixed for completion of the contract plus any authorized extensions thereof or where the flooding of the work is due to fault or negligence of the Contractor, as determined by the Contracting Officer. Time extensions allowed for flooding will be computed from the day when overtopping occurred to and including the day when unwatering and clean-up operations have been sufficiently completed to permit resumption of work
[fol. 727] within the protected areas; provided that the work of unwatering and clean-up has been prosecuted in as rapid and diligent a manner as practicable. Any extension of time granted the Contractor due to flooding shall not be a basis of a claim against the Government.

c. In the event that the total amount actually due the Contractor for work performed hereunder exceeds the total *estimated* amount due under the contract as set forth in Article 1 thereof, the time for completion will be extended in the proportion that such *excess* bears to the total *estimated* amount due under the contract. Should the total payments hereunder be less than the total estimated amount of the contract, the date of completion as specified in paragraph *a* above will not be affected.

SC-2. *Liquidated Damages.* In case of failure on the part of the Contractor to complete the work within the time fixed in the contract or any extensions thereof, the Contractor shall pay the Government as liquidated damages the sum of $250 for each calendar day of delay until the work is completed or accepted.

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SC-7. *Physical Data.*

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c. Transportation Facilities. (1) *Highways.* State Highway No. 36 crosses the dam site and is to be relocated in part under this contract. For protection

of highway traffic during construction, see paragraph TP1-03.

(2) *Railroads.* The Erie Railroad passes the dam site and is to be relocated in part under this contract. The Erie Railroad and the Pittsburgh, Shawmut and Northern Railroad serve Hornell, New York. The railroads report sidings at Hornell for the accommodation of approximately 190 cars. The Contractor shall investigate the availability of sidings both at the site of the work and elsewhere and shall make all necessary arrangements with the railroads for the delivery of materials and equipment. For the protection of railroad traffic during construction, see paragraph TP1-04.

* * * * *

SC-19. *Protection of Existing Structures, Utilities and Work.* *a.* The Contractor shall protect all existing structures, utilities and work of any kind against damage or interruption of service. Damage or interruption of service resulting from failure to do so shall be repaired or restored promptly by or at the expense of the Contractor.

[fol. 728] *b.* The term "utilities" as used herein shall be construed to include all power, telephone, telegraph, gas, air and water lines existing on the site at the time of commencement of work under the contract. All necessary alterations to existing utilities will be made by their respective owners, except that abandoned utilities shall be removed by the Contractor. The Contractor shall cooperate in maintaining all utilities within the limits of construction operations and shall work in close coordination with the respective owners while required relocations of their utilities are being made. The Contractor shall request the removal of all utilities in the way of construction operations in writing to the Contracting Officer not less than 30 days prior to the date of desired removal. Where possible, utilities will be removed well in advance of construction operations. If after the expiration of the 30-day required notice period, utilities to be relocated by

their owners cause delays in the contract work, an extension of time for completion of the contract work will be granted equal to the extent of such delay, provided that such extension shall not be a basis of a claim against the Government.

SC-20. *Damage to Work.* The Contractor shall be responsible for all work until completion and final acceptance thereof. However, if in the judgment of the Contracting Officer, any part of the permanent work, including the upstream cofferdam, performed by the Contractor is damaged by flood, which damage is not due to the clogging of the tunnel or trash beams, or the failure of the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, additional payment for the repair of such damaged permanent work as ordered by the Contracting Officer will be made at the applicable contract unit or lump sum prices as fixed and established in the contract, which shall be full compensation therefor. If, in the opinion of the Contracting Officer, there are no contract unit or lump sum prices applicable to a part of such work, an equitable adjustment pursuant to Article 3 *Changes* of the contract will be made as full compensation for the repairs of that part of the permanent work for which there are no applicable contract unit or lump sum prices. Except as herein provided, damage to all work, (including temporary construction) utilities, materials, equipment and plant shall be repaired to the satisfaction of the Contracting Officer at the Contractor's expense, regardless of the cause of such damage.

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[fol. 729] SC-23. *Work Areas. a.* The grounds, easements, rights-of-way and other rights necessary in the opinion of the Contracting Officer for the work under this contract, including those needed for access roads, borrow pits and spoil banks, will be furnished by the State of New York through the Department of Public Works, and will be made available

for the Contractor's use. The Government will not be responsible for any delay in furnishing the grounds, rights-of-way, easements, etc., but in case the furnishing of necessary rights-of-way causes delay in prosecution of the work of the Contractor, the Contracting Officer will grant an extension of time for the completion of the work equal to the time of such delay. It is expressly understood and agreed that such time extension shall not be the basis of a claim against the Government.

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SC-24. *Unwatering Work Areas.* Unless otherwise specifically authorized, all permanent structures shall be constructed "in the dry." For this purpose the Contractor shall provide such cofferdams, diversion channels, drains (including drain tile and French drains), flumes or other temporary structures, and such pumps and other equipment as may be necessary for unwatering foundations and work areas not included within the scope of care and diversion of stream as specified in Section 1 of Part IV of these specifications. Such structures shall be subject to the approval of the Contracting Officer, but such approval will not relieve the Contractor of responsibility for the adequacy of the work. Upon completion of the work all such temporary structures shall be removed from the site. Under drains shall be plugged with concrete after serving the purpose for which intended. Separate payment will not be made for pumping, providing and removing any temporary protective works and equipment specified above, and plugging underdrains, but the cost thereof shall be included in the contract unit prices for the various items of the permanent work.

* * * * *

SC-27. *Cooperation With Other Agencies.* While work under this contract is in progress, construction of the permanent highway paving and new highway bridge and the relocation of the railroad track work will be carried on at the site by other agencies.

All agencies engaged simultaneously on work at the site shall have equal rights to the use of such work and access areas as may be necessary for the
[fol. 730] conduct of their respective operations. The Contractor shall conduct his operations so as not to unduly interfere with the operations of others working at the site. The Contractor will not be required to maintain the permanent highway paving, the new highway bridge or the railroad track work as such maintenance will be the responsibility of other agencies.

SC-28. *Final Examination and Acceptance.* As soon as practicable after the completion of the entire work or any divisible part thereof as may be designated in these specifications, a thorough examination thereof will be made by the Contracting Officer at the site of the work. If such work is found to comply fully with the requirements of the contract, it will be accepted, and final payment thereof will be made in accordance with Article 16 of the contract.

Section I. Diversion of Stream and Protection of Traffic

TP1-01. *General.* Work under this section shall consist of the care and diversion of the stream and the protection of highway and railroad traffic. The Contractor shall furnish all equipment, materials, and labor required to accomplish the above work, all as indicated on the drawings, specified herein, or directed by the Contracting Officer.

TP1-02. *Care and Diversion of Stream During Construction. a.* General. At all times prior to permanent diversion through the tunnel the Contractor shall maintain an unobstructed channel 150 feet wide, at valley floor elevation, between the end of the embankment slope and the opposite abutment. He shall be responsible for the safety of the work, and additional time other than that provided for in paragraph SC-1 will not be allowed for delays resulting from failure on the part of the Contractor to provide the necessary protection.

b. Order of Work. Temporary and permanent diversion and control of the stream shall be accomplished as indicated on the drawings. Temporary protection shall be provided during construction of the outlet works. All other temporary protective works and temporary diversion shall be completed prior to diversion of highway traffic. Permanent diversion through the outlet works shall be made only upon written instructions from the Contracting Officer (see subparagraph TP6-01*d*) and when the following minimum items of work have been completed.

[fol. 731] (1) Outlet works to elevation 1265, including the tunnel, approach and outlet channels complete, and all riprap around the intake structure.

(2) The railroad relocation and protection and highway relocation complete, the dam south of the existing highway to elevation 1320, and remainder of the dam embankment, except the closure section, to elevation 1300.

(3) All other pertinent work that may be directed by the Contracting Officer. By the time the closure section has been completed to elevation 1300, the spillway approach channel excavation shall be completed to elevation 1294 and the remainder of the spillway excavation shall be completed. All concrete in the spillway, except monoliths 4 to 11 inclusive of the weir, shall be completed by the time the closure section of the dam embankment has been constructed to elevation 1310. Monoliths 4 to 11 inclusive of the weir shall not be constructed above elevation 1294 until the closure section of the embankment has been constructed to elevation 1310. All other work shall be completed during the season in which the embankment closure section is completed.

c. Temporary Diversion. (1) *Stream Channel.* The relocated channel for temporary diversion of the stream shall be constructed to the lines, grades, and cross sections as shown on the drawings. Materials from this excavation shall be temporarily stock piled in the protection levee as specified in subparagraph (2) below and later removed and disposed of as directed.

(2) *Temporary Protective Works.* A temporary protection levee shall be constructed upstream from the main embankment as indicated on Sheet No. 16 of the drawings. Final location and extent of this levee shall be submitted by the Contractor for approval of the Contracting Officer. The protection levee shall be constructed of channel excavation materials and will require no special compaction. The Contractor shall provide for the protection of the outlet works effective to elevation 1245 upstream and 1230 downstream by leaving unexcavated such portions of the approach and outlet channels as will provide the necessary protection or otherwise protect the outlet works. If access openings are made in the protective works, the Contractor shall have on the site sufficient sandbags to close the openings. The Contractor shall be fully responsible for the adequacy of the protective works except as provided in subparagraph SC-20, and any damage resulting from
[fol. 732] failure of such works shall be repaired or replaced at the Contractor's expense. Clearances between the protective works and permanent structures shall be sufficient to permit unwatering and provide sufficient working area to accomplish the construction work. At the time of permanent diversion the protective works shall be removed in accordance with subparagraph TP1-02*d* following,

d. Permanent Diversion. (1) *General.* When the items of work specified in subparagraph TP1-02*b* have been completed and upon written instructions from the Contracting Officer, the Contractor shall make permanent diversion of the stream.

(2) *Procedure.* (a) *Removal of Temporary Protective Works.* The temporary protective works shall be removed to the lines and grades as shown on the drawings or as directed by the Contracting Officer. Suitable materials from the temporary protective works shall be used in the permanent structures. All other materials shall be disposed of as directed.

(b) *Upstream Cofferdam.* After filling with waste materials the temporary diversion channel down-

stream from its junction with the approach channel to the outlet works and constructing the permanent blanket on the end of the dam embankment as specified below, the Contractor shall construct the upstream cofferdam to elevation 1265 at the location and to the lines and grades shown on Sheet No. 16 of the drawings. It shall be constructed of select pervious material, placed and compacted in accordance with the applicable provisions of paragraph TP6-02, and covered on the upstream face with a temporary blanket 5 feet in thickness consisting of sand and impervious materials as indicated on the drawings. Prior to construction of the cofferdam, the Contractor shall construct a permanent blanket on the end of the dam embankment, extending from the impervious section to the upstream face of the dam and up to elevation 1265. The permanent blanket shall be similar to the temporary cofferdam blanket specified above, with the impervious material placed adjacent to the embankment. This permanent blanket and the upstream cofferdam will remain as part of the permanent structure. The temporary cofferdam blanket shall be removed in accordance with subparagraph TP1-02*e*.

e. Removal of Cofferdam Blanket. After the embankment closure section has been completed above elevation 1265, the Contractor shall remove the temporary cofferdam blanket above the elevation of the
[fol. 733] adjacent spoil berm to the slope lines of the upstream cofferdam. The material removed shall be disposed of in the embankment or as otherwise directed. Select pervious materials excavated from within the finished slope lines shall be replaced with approved materials at the Contractor's expense.

TP1-03. *Protection of Highway Traffic.* a. *Highway 36.* The Contractor shall maintain and protect two-way traffic on the existing highway through the work area until the completion of the highway relocation and completion of the new Canacadea Creek bridge which will be constructed under a separate contract. When specifically authorized by the Con-

tracting Officer, the Contractor shall construct the temporary detour at the east end of the highway relocation, close the existing highway, and direct traffic over the relocation. All measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the New York State Department of Public Works, Division of Highways.

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TP1-04. *Protection of Railroad Traffic.* The Contractor shall notify the Contracting Officer not less than 15 days in advance of the date he desires to enter railroad property so that due notice may be given the owners. Upon approval by the Contracting Officer, the Contractor shall proceed with the work and continue without interruption, completing it in the shortest time possible. Work on and adjacent to railroad property shall be performed with extreme care and in such a manner that there will be no interruption of rail traffic. The Contractor shall furnish necessary flagmen and comply with all requirements of the railroad relative to his operations. In planning and prosecuting construction operations on railroad property, the Contractor shall work in close cooperation with the railroad, and shall submit details of his proposed method of operation for the approval of the railroad. On all work adjacent to the railroad the Contractor will be required to provide such temporary protection as may be deemed necessary by the railroad. The Contractor shall make arrangements with the railroad to pay all necessary costs of temporary protection including such costs as the expense of flagmen provided by the railroad.

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[fol. 734] TP3-04. *Borrow Excavation.*

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b. Excavation Procedure. (1) *General.* The Contracting Officer will control the execution of borrow excavation. He will direct the locations at which excavation shall be made, the depth of cuts and lifts, and the disposition of the excavated material in the several sections of the embankment. The Contractor will be required to change the location and depth of excavating operations whenever such change is necessary to obtain the proper quality of materials for the part of the embankment under construction. Excavation of materials for use in the construction of the embankment shall be conducted so as to segregate or to secure the desired mixtures of materials for the different classes of materials designated for use in the various parts of the work. Excavation shall be performed so that the materials for the full depth of lift are mixed in the process of excavation. The term "lift" as used herein means the full workable depth of the material which is as a whole suitable for one class of embankment material or which must be wasted. Stripping of the borrow areas shall consist of the excavation of the surface lift and shall be performed only in such areas and to such depths as may be directed. Borrow excavation shall include the clearing and grubbing of the designated areas actually worked, clearing of stockpile and spoil areas, maintaining satisfactory drainage, and the disposal of objectionable materials in designated spoil areas. Necessary clearing and grubbing operations may be prosecuted as the materials are being excavated provided the objectionable materials are separated from the suitable materials.

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SECTION VI. EMBANKMENT

TP6-01. *General. a. Definition.* The term embankment as used in these specifications is defined as the earth and rock fill portions of the dam, the railroad relocation and protection, the access road, the highway relocation and the levee at Borrow Area 3.

For dumped riprap and rock in downstream toe trench see Section VIII.

b. Classification of Materials. Embankment materials are classified according to type, location, and method of placing as follows:

[fol. 735]

Type	*Location*	*Placing*
Impervious	Core section of dam and railroad protection and the upstream cofferdam blanket.	6″ layers—compacted
Transition	Between impervious and select pervious sections of the dam and railroad protection below Station 130+00.	6″ layers—compacted
Random	Highway relocation downstream from approximate Station 115+00, access road and temporary detours at each end of the highway relocation.	24″ layers—uncompacted
Random	Between impervious and previous sections of the dam, in the levee at Borrow Area 3 and in the railroad relocation.	12″ layers—compacted
Random	Highway relocation between approximate Station 115+00 and Station 133+00 and upstream from Station 146+00.	8″ layers—compacted
Select Pervious	Shell section on the reservoir side of the dam and railroad protection below Station 136+75, and highway relocation between Stations 136+75 and 146+00.	12″ layers—compacted

Type	*Location*	*Placing*
Pervious	Downstream section of the dam and railroad protection below Station 130+00.	12″ layers—compacted
Pervious	Central section of the highway relocation between Stations 136+75 and 146+00.	8″ layers—compacted

c. Scope of Work. The Contractor shall spread and consolidate the materials required for the embankments to the elevations, lines, grades and cross sections indicated on the drawings or as established by the Contracting Officer.

d. Order of Work. The Contractor shall construct the embankment in sections as indicated on the drawings and as specified below (see also subparagraph TP1-02*b*);

[fol. 736] (1) The embankment for the railroad protection, the highway relocation and the dam embankment on the south side of the existing highway, within the limits shown on the drawings, shall be completed to top elevation prior to diversion of highway traffic.

(2) The dam embankment between the section specified in (1) above and the closure section shall be completed to elevation 1300 prior to permanent diversion and construction of the closure section. In lieu of stockpiling excess embankment materials, the Contractor may place such materials between the existing highway and the closure section prior to diversion of highway traffic as directed or approved by the Contracting Officer.

(3) After permanent diversion, the closure section of the dam embankment shall be constructed to elevation 1300. The closure section and the section specified in subparagraph (2) above shall then be constructed to elevation 1320 in such a manner as to permit construction of the entire length of uncompleted embankment in one operation. During such

construction the portion of embankment adjacent to the left abutment shall be kept approximately 2 feet lower than the remainder of the embankment by sloping the embankment along the axis of the dam as shown on the drawings or as directed by the Contracting Officer. The embankment shall be completed during the second working season. The Contractor will be required to show to the satisfaction of the Contracting Officer that there is sufficient equipment on the work to complete the closure section and all other portions of the dam embankment to elevation 1320 during the second working season before authority will be given to make permanent diversion.

e. Source of Materials. Materials for embankment shall be obtained from required excavations and borrow areas as directed by the Contracting Officer. In general it is anticipated that the sources of embankment materials will be in accordance with the provisions of subparagraph TP3-01*b*, but the right is reserved to obtain such materials from any source and in any quantity as may be desired. The disposition of the materials from any source will be determined according to the suitability and classification of the materials. Materials from three origins may be required to be used at the same time in the same part of the embankment, or materials from any one source may be required to be used in different parts of the work.

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[fol. 737] TP6-02. *Embankment Construction.*

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c. Placing and Spreading of Materials. Embankment material shall be deposited in areas of the embankment as directed or approved by the Contracting Officer. The excavation and embankment placing operations shall be combined as directed by the Contracting Officer so that the material when compacted will be blended sufficiently to secure the best practicable degree of compaction and stability. In general,

impervious fill material will be used for the core trench, inspection trench, and the central part of the embankment grading to more pervious material on the outer slopes. The distribution and gradation of materials shall be such that the embankment will be free from lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding materials. When two or more classes of materials are being placed in a section of the embankment they shall be systematically spotted, dumped, and bulldozed so that in any area of the section there are approximately the correct proportions of the required materials. After dumping the materials in the embankment the various classifications of embankment materials shall be bulldozed or otherwise spread in layers of the applicable thickness specified in subparagraph TP6-01*b*. During the dumping and spreading operations the Contractor shall remove all brush, roots, sod, and other unsuitable materials as determined by the Contracting Officer, and dispose of them in accordance with subparagraph TP2-01*a*. Stones having a thickness greater than the permissible thickness of the spread layer or a surface area which would cause interference with the compaction of the embankment material, if suitable for dumped riprap or rock in the downstream toe trench shall be placed in those sections of the permanent work and if unsuitable for the above uses, shall be broken up and scattered in the embankment to the satisfaction of the Contracting Officer or wasted as directed. No embankment material shall be placed on or against frozen surfaces nor shall frozen materials be placed in the embankment. When specifically directed by the Contracting Officer, the Contractor shall stock pile frozen materials for later use in the embankment. The use of shale will not be permitted in any of the permanent embankments, except that embankments for the highway relocation downstream from approximate Station 115+00, the access road, and the temporary detour at each end of the highway relocation, shall

[fol. 738] be constructed predominately of shale and other waste rock with a binder of spoil common materials. Nesting of rocks will not be permitted and the amount of binder shall be sufficient to fill all voids between the rocks. In the said highway relocation and access road, embankments, stones larger than 2 cubic feet in volume shall not project within 2 feet of the fine grade and large stones shall not project within 6 inches of the side slope lines.

e. Moisture Control. The embankment materials, before rolling, shall have the proper water content required for compaction as determined by the Contracting Officer. The Contractor may be required to wet the surface of the preceding compacted layer, the dumped material before spreading, or the spread uncompacted layer before rolling. Harrowing or mixing the spread material may be required whenever necessary, in the opinion of the Contracting Officer, to secure a uniform moisture content. The moisture content shall be so regulated as to obtain the amount essential to required compaction. Should the material be too wet to permit proper compaction by rolling, the rolling and work on all portions of the embankment thus affected shall be delayed until the material has dried to the required consistency. If additional moisture is required, it shall be added by any means proposed by the Contractor and approved by the Contracting Officer.

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13. The Almond Dam, as constructed, is an earthen flood control dam having three principal features common to such dams, (1) a main dam consisting of an embankment constructed of compacted earthen materials; (2) an outlet works for control of the reservoir, and (3) a spillway constructed at an elevation lower than the dam, to drain off excess water in the event of flood conditions.

The main dam is constructed to elevation 1320 feet. Connected to it and extending upstream on the right abutment [1] is a supplemental extension or "arm" for

[1] In accordance with established engineering practice, when references are made to "right" or "left" it is assumed that one is facing downstream.

the protection of a relocated railroad and a state highway formerly located within the dam site which were contained, in part, in cut below the top elevation of the dam. Paralleling the axis of the dam a core trench, the purpose of which was to prevent seepage of water under the embankment, was excavated to below the dam foundation [fol. 739] extending from abutment to abutment. The core trench was filled with impervious material and compacted to the elevation of the foundation. The embankment was then constructed on top of the core trench. Necessarily, the core trench had to be completed before the placement of materials to any extent could proceed in the area of the foundation immediately above the trench.

The outlet works, constructed in the left abutment of the dam, is composed of three principal features, (1) a concrete intake and operating house which contains the gates and machinery for controlling the flow through the outlet works; (2) a horseshoe-shaped concrete lined tunnel 710 feet in length, drilled through the rock of the left abutment; (3) a downstream stilling basin from which the flow through the tunnel returns to the natural stream bed below the dam. At the time of permanent diversion of the creek during the construction period a permanent approach channel was excavated in the reservoir area above the dam to direct the normal water flow into the outlet works.

The spillway was excavated in open cut into rock in a saddle to the left of the outlet works, the intake thereto being excavated in rock down to elevation 1,294 feet. Immediately adjacent to and downstream of the intake is a concrete weir constructed across the spillway at crest elevation 1,300 feet, 20 feet lower than the crest elevation of the dam. The only purpose of the spillway is to serve as a "safety valve" to protect the dam from washout in the event of unusual flood conditions.

14. In the course of construction there were certain features in the sequence of operations peculiar to Almond Dam which are pertinent to the consideration of damages in this case:

(a) To construct the dam embankment it was necessary to relocate a branch line of the Erie Railroad passing along the intended site of the right abutment of the dam.

Under the contract the plaintiff was required to excavate for and prepare a new subgrade for the railroad by cutting back into the right abutment. The actual work of track relocation was performed under a separate agreement between the Government and the railroad.

[fol. 740] (b) New York State Highway No. 36 passed through the valley generally parallel to Canacadea Creek and bisected the location of the proposed dam approximately at its center. Under its contract plaintiff was required to relocate and construct a new highway in the right abutment of the dam in close proximity to the relocated railroad. The site of the new highway relocation occupied, in part, the old bed of the relocated railroad tracks. The final surfacing of the new highway and the construction of a new bridge across Canacadea Creek were performed under a separate agreement between the United States and the State of New York after plaintiff had completed its highway work. It was a requirement of plaintiff's contract that traffic over existing Highway 36 be maintained until the new highway was completed and opened to traffic.

A telegraph line along the old railroad bed had to be relocated by others along the relocated railroad bed. A telegraph line and an 8-inch gas main along old Highway 36 also had to be removed by others.

15. In accordance with the plans and specifications as set forth in finding 12, the various portions of the dam relating to the instant claim for damages were required to be constructed in the following order:

(1) A new subgrade for the existing railroad line was to be excavated by cutting back into the right abutment.

(2) Simultaneously with the construction of the new railroad cut, the dam embankment south of existing Highway 36 was to be built up to elevation 1320.

(3) The roadbed for the relocation of State Highway No. 36, part of which was located on the site of the old railroad line, was then to be constructed.

(4) Immediately upon completion of the new highway, traffic was to be diverted thereon and old Highway 36 closed.

(5) It was then required that Canacadea Creek be temporarily diverted in order to permit cleaning out of the upstream bed within the foundation area of the dam.

(6) Having diverted the traffic and temporarily diverted the stream it was then required that the dam embankment north of and including the old highway to the point of closure, be built up to elevation 1300 except for the closure section.

[fol. 741] (7) The creek was then to be permanently diverted through the completed diversion tunnel at which point work could commence in the closure section of the dam.

(8) The permanent cofferdam upstream of the closure section of the dam was then to be built up to elevation 1265.

(9) The closure section itself was then to be built up to elevation 1300.

(10) Concurrently with the building up of the closure section to elevation 1300 the spillway approach channel was to be excavated down to elevation 1294. The reason for the requirement that these two operations be concurrent was to provide for a minimum hazard during this phase of construction. By keeping the spillway elevation below the embankment elevation as required a place was provided in the nature of a safety valve, where flood water would drain off before reaching the main embankment. As a further safety factor, it was required that the level of the closure section be kept two feet below the level of the main embankment until completion thereof.

16. The specific sequence of operations for the construction of the dam as set out in finding 15 were so coordinated for a definite purpose. Primarily the prerequisites to stream diversion were set out so as to minimize the effect of possible heavy flood conditions occurring during construction and to prevent destruction of the partially completed dam, with the resultant risk to life and damage to property which could occur in areas downstream of the work.

Secondly, the required sequence of operations provided partial insurance to the Government and to the contractor from financial loss had a flood occurred during construction which could top that much of the embankment constructed to date and result in a washout of the entire dam.

The outlet works was not designed to carry off the flow of the stream during periods of flood. Highwaters in the Canacadea Creek watershed could be expected normally in the spring and fall months. However, the hydrographs which are a part of the contract plans, show that peak flood conditions could be expected during other seasons of the year. The highest flood condition recorded was during the month of July 1935 when the run-off was 22,000 cubic feet per second. This was about four times as great a volume as occurred during any other period [fol. 742] of flooding during the period 1925-1941. It was to protect against such an unhoped for contingency that a heavy flood might occur during the period of construction which caused the Government engineers who designed the dam, and those who prepared the specifications, to spell out the phases of construction which would be required before the stream could be diverted. In periods when there had been no heavy rains in the upstream watersheds, the stream was very small but there were two or three instances during construction when high water interfered with the work. It can be seen then why it was so important that the work of the railroad relocation and highway relocation, and the embankment along them, plus placement of embankment of more than half of the main dam, were required before the stream could be permanently diverted through the tunnel.

17. The plaintiff's witnesses have testified that if the plaintiff had not been delayed by the Government in connection with tunnel supports, it could have diverted the stream through the tunnel about a year earlier than it did so and that it could have finished all remaining embankment in the 1947 work season. This testimony is not convincing for three reasons. First, this would have required a major change in the specifications as to how much work should be finished before permanent stream

diversion with the chance of great damage to embankment operations in event of heavy flooding as the tunnel was only designed to carry a flow of 4,000 cubic feet per second with the water at an elevation of 1,265 feet. The finished dam was at 1,320 feet elevation with the crest of the spillway having an elevation of 1,300 feet. Secondly, there was State Highway 36 crossing the main dam area about in the center and it would have been necessary to depart from the specification as to the movement of highway traffic during construction. It is true that this traffic was detoured around the work area from May to September of 1948, but if the stream had been diverted in 1947, it would have made this detour extend for a period of about a year and one half, instead of from May 1948 to September 1948. In this connection very great concern was indicated by the state and county road authorities because Highway 36 carried 5,000 vehicles over a 12-hour period each day, 1,000 of which were [fol. 743] trucks; and these vehicles, during the detour, had to pass over a railroad grade crossing. Thirdly, the volume of excavation and actual placement of embankment, as indicated in the plaintiff's payment estimates, clearly shows that it would not have completed all embankment in the 1947 work season.

18. Although it was important to the progress of the work from an overall standpoint to coordinate construction of the dam embankment and the spillway excavation with construction of the outlet works, which included construction of the diversion tunnel, so as not to delay diversion of the stream, the progress of construction of the dam and spillway could have proceeded to a considerable extent independently of, and without interference by, outlet works construction. The outlet works were physically outside the area of dam embankment and spillway operations. The equipment used in outlet works construction consisted of the concrete plant and related items, whereas dam and spillway construction, prior to diversion, employed earth-moving and compacting equipment such as scrapers, shovels, trucks, sheepsfoot rollers, bulldozers, etc.

As hereinbefore shown, in accordance with the plans and specifications, before stream diversion could be ac-

complished, the contractor was required to be at a stage of construction, where the railroad had been relocated, the highway, in part, relocated on the site of the old railroad bed and traffic diverted thereon, the embankment south of old State Highway 36 built up to elevation 1320, and the embankment north thereof built up to elevation 1300 up to the closure section. The outlet works, therefore, need not have been ready for stream diversion until the aforementioned steps, with respect to the progress of construction of the main embankment, had been reached.

Dam embankment construction on the other hand was related to spillway excavation in that all suitable common materials excavated in the spillway were required to be utilized for placement in the dam embankment.

19. At the commencement of the work, in August 1946, plaintiff submitted a progress schedule of work operations as required by the contract. Pertinent features of the work were scheduled thereon as follows:

[fol. 744]

	Schedule completion
3—*Stripping and Common excavation:*	
a. Railroad subgrade	May 31, 1947
c. Spillway	Nov. 15, 1947
4—*Rock excavation:*	
a. Railroad subgrade	June 30, 1947
c. Spillway	June 30, 1948
5—*Tunnel:*	
b. Concreting	Aug. 31, 1947
7—*Embankment*	Nov. 15, 1947
9—*Concrete:*	
b. Intake and Stilling Basin	Nov. 15, 1948
Highway No. 36 closed	Apr. 30, 1948
Permanent stream diversion	Aug. 15, 1948
Job as a whole	Jan. 15, 1949

The progress schedule made no reference to the time of temporary stream diversion provided for under the contract. At no time during construction did the plaintiff, by writing or otherwise, indicate to defendant's agents that it intended to divert the stream through the completed tunnel earlier than August 15, 1948.

20. During the course of construction several key delays affected the time when the dam embankment was finally built up to the point where stream diversion was permitted under the contract.

The plaintiff was dilatory in completing the railroad relocation and subgrade which were scheduled for completion on June 30, 1947. This was not substantially completed until October 9, 1947, at which time, because of the possibility of freezing conditions that late in the year, the Erie Railroad officials refused to relocate its tracks. This work was not completed by the railroad until October 1948.

The delay in railroad relocation in turn delayed relocation of State Highway 36, part of which was to be on the old railroad bed. The highway relocation scheduled for April 30, 1948 was not completed and opened to traffic until October 13, 1948.

Until Highway 36 was relocated plaintiff could perform dam embankment operations north of old Highway 36 to a limited extent only. Construction operations in that area were restricted by the specification requirements that State Highway 36, which bisected the dam foundation, remain open to traffic, and that closure section, 150 feet in width at the bottom, in the bed of Canacadea [fol. 745] Creek, remain open uptil such time as diversion of the creek could be accomplished.

South of Highway 36 embankment operations proceeded in the summer and fall of 1947. However, during the spring and early summer of 1947 very little embankment placement was performed due to poor weather conditions. Plaintiff later received an extension of time therefor.

21. Realizing that its failure to timely relocate the state highway would result in delay of further embankment operations plaintiff, in the spring of 1948, took action to break this bottleneck.

By agreement with the Superintendent of Highways, Steuben County, New York, which agreement was approved by the contracting officer and the New York State Department of Public Works, plaintiff was permitted to detour the traffic from existing Highway 36 via an alternate route over a county road known as Webb's Crossing Road. The detour was made effective May 28, 1948. Fol-

lowing the elimination of highway traffic through the dam site, embankment operations proceeded expeditiously.

In the meantime concreting of the tunnel had been completed by May 8, 1948 and sufficient concrete work had also been completed on the intake works, operating house and stilling basin so that by August 14, 1948, when the embankment had been sufficiently built up to the required elevation, the stream was diverted through the outlet works. Construction of the closure section of the dam commenced immediately thereafter.

Permanent diversion of the stream was thus accomplished almost to the day anticipated by the plaintiff on its original progress schedule. (See finding 19.)

22. It is clear that the work of concreting in the tunnel and also in the inlet works and outlet works was seriously disrupted by the failure to authorize the installation of tunnel supports earlier than the letter of authorization dated August 11, 1947 which was received by the plaintiff about August 14, 1947. The plaintiff in the exercise of sound judgment had engaged the services of numerous independent qualified engineers for consultation as to what might be required in the way of support for the tunnel. It acted on the advice of such engineers, and [fol. 746] about three weeks before authority had been given to install the steel arch ribs and liner plates in the tunnel, on July 25, 1947, placed its order for the steel.

23. The plaintiff, on August 15, 1947, promptly began the installation of the tunnel supports upon receipt of the steel and they were installed by October 8, 1947. The space above the liner plates had to be filled with backpacking, rock and boulders which could be handled by one man crawling between the liner plates and the overhead in the rock tunnel. The backpacking operation was finished in October 18, 1947.

24. Since the delay incident to authorizing the tunnel supports required concreting operations in winter weather, it then became necessary to winterize the concrete plant and this was accomplished by the plaintiff. Concreting operations in the tunnel commenced on December 15, 1947 and continued until May 8, 1948. Concreting operations began in the intake area sometime after July

25, 1947 but this work could not move along expeditiously since the installation of the tunnel supports and backpacking interferred. The original plan of work operations submitted by the plaintiff called for the concreting of the intake and stilling basin from early July 1947 to the close of the 1947 work season. These two items were the inlet works on one end of the tunnel and the outlet works and stilling basin at the downstream end of the tunnel.

25. The original plan of operation called for the plaintiff to do the concreting of the spillway from April 15 to October 31, 1947. It should be noted that the location of the spillway was several hundred feet north of and generally parallel to the area of the stilling basin.

26. Subsequent to March 25, 1947, when the initial work of cleaning up the floor of the tunnel had been accomplished, after the tunnel had been holed through, there were additional falls of rock from the roof of the tunnel and the sides. As a result, before placing concrete lining, it was necessary to rescale both the sides and roof of the tunnel, pick up and load and haul out the rock that had fallen from the roof and sides, also reclean the invert of the tunnel. This work was performed from August 23, 1947 to October 18, 1947. Plaintiff's extra costs of per- [fol. 747] forming this work were as follows:

Direct labor, plus insurance, taxes and overhead	$1,187.48
Field supervisory labor, plus insurance, taxes and overhead	121.81
Cost of materials and other expenses, plus overhead	3.26
Sublet work: Paid to subcontractor, plus overhead	4,620.53
Hired equipment: Paid to equipment owners, plus overhead	1,415.42
Use of owned equipment: At 1947 AED Manual rental rates less 15% profit	1,093.58
Total: Claim Item 2	$8,442.08

27. The plaintiff received official authorization from the defendant to install the steel arch ribs with liner plates in the Almond Tunnel, but at its own expense, by letter from the Acting District Engineer dated August 11, 1947. Plaintiff, however, ordered steel ribs and liner plates from the manufacturer on July 25, 1947, which

was as soon as plaintiff knew the size of adequate supports which had to be installed before concrete lining of the tunnel could proceed. By that time plaintiff had been advised by its engineering consultants, and the Liberty Mutual Insurance Company, that the design of tunnel protection recommended by the contracting officer was inadequate.

The plaintiff installed permanent tunnel supports in the central 610-foot portion of the Almond Tunnel in the form of steel arch ribs and liner plates, performing such installation between mid-August and mid-October 1947. This installation was exclusive of the two 50-foot ends for which the plaintiff was compensated.

28. The plaintiff's extra costs for the labor, materials, and equipment used in the installation of the permanent tunnel supports installed were as follows:

Direct labor, plus insurance, taxes and overhead	$1,190.33
Field supervisory labor, plus insurance, taxes and overhead	134.92
Cost of materials and other expenses, plus overhead	23,228.86
Sublet work: Paid to subcontractor, plus overhead	5,550.65
Use of owned equipment, application of 1947 AED rental rates, less 15% profit factor	1,143.93
	$31,248.69
[fol.748]	
Less taxes, insurance and overhead	—$3,447.90
	$27,800.79
Plus 15% profit	4,170.12
	$31,970.91
Plus taxes, insurance and overhead	3,447.90
	$35,418.81

29. As a result of the overbreak of rock in the Almond Tunnel there remained a space between the bore of the tunnel and the liner plates installed. The entire area between the liner plates and the roof and the sides of the tunnel required backpacking with material which would prevent the further fall of rock and properly support the roof. This area requiring backpacking was be-

yond the 50 feet of the inlet and outlet portals of the tunnel. The contract did not require backpacking where permanent supports were not required. Below the liner plates the concrete extended out to the bore of the tunnel and on the invert the entire area was filled with concrete. Above the spring line and where the liner plates were placed there was no concrete placed outside the plates. The backpacking of fragments of stone was packed in tightly and later, after the installation of the concrete lining of the tunnel, the plaintiff pumped sand into the area to fill the voids between the stone following which grout was pumped into the area under low pressure to make the area solid. The stone backpacking was installed during the weeks ending August 30, 1947, through October 18, 1947. The sand backpacking was installed during the weeks ending May 15, 1948 through July 3, 1948.

30. The grouting which was performed subsequent to the sand backpacking was the pumping into a given volume of material of cement and water or sometimes cement, sand and water to solidify the mass, to fill in the voids between the particles. If the changed conditions resulting in the fall from the roof of the tunnel had not occurred grouting would not have been necessary and it was not a pay item in the original contract but an extra cost to the plaintiff.

31. As the steel ribs were erected in the tunnel, the plaintiff's engineers took cross sections of the tunnel at least every ten feet to determine the aperture of the whole tunnel so that it could be drawn on cross sections. [fol. 749] From the information gained in this survey and computations by the plaintiff's engineers, from the engineering information and the contract specifications, the volume remaining between the liner plates and the roof of the tunnel was computed and tabulations made of the total volume in cubic yards between the points 50 feet in from each end of the tunnel. Thus, determination was made of the actual volume of space above the liner plates to the roof of the tunnel in the 610 feet where the additional steel ribs were installed. This volume of space that required backpacking and grouting amounted to 14,553 cubic feet. The plaintiff's engineering staff determined the percentage of voids which was the space

not solidly filled by either stone or sand in backpacking that had to be filled with grout. The percentage was determined by acceptable standard engineering practices and observation to be 40 percent of the volume of the whole backpacked area between the liner plates and the roof of the tunnel. The cost of the grouting was determined by applying to 40 percent of the volume of the whole backpacked area the contract price of $2.50 per cubic foot, less 15 percent for a profit factor on that item.

32. Plaintiff's extra costs of backpacking and low pressure grouting totaling $29,332.92 were as follows:

Stone Backpacking:	
Direct labor, plus insurance, taxes and overhead	$595.79
Field supervisory labor, plus insurance, taxes and overhead	58.47
Cost of materials, etc., plus overhead	1,990.80
Sublet work: Paid to subcontractor, plus overhead	3,890.52
Use of owned equipment: At 1947 AED rental rates, less 15% profit factor	724.68
Sand Backpacking:	
Direct labor, plus insurance, taxes and overhead	5,669.29
Field supervisory labor, plus insurance, taxes and overhead	428.06
Cost of materials, etc., plus overhead	2,222.95
Owned equipment: At 1947 AED rental rates, less 15% profit factor	1,382.31
Low Pressure Grouting—14,553 cu. ft. ×.40% (Voids) ×$2.125 per cu. ft.	12,370.05
	$29,332.92

[fol. 750]

Less taxes, insurance and overhead	—$2,003.11
	$27,329.81
Plus 15% profit	4,099.47
	$31,429.28
Plus taxes, insurance and overhead	2,003.11
	$33,432.39

33. The plaintiff placed additional concrete in the tunnel. This concrete was placed in the tunnel outside the pay lines established by the Government which was over

and above the volume of concrete paid for by the defendant to the pay lines. The ultimate bore of the tunnel was larger in all its points throughout its complete circumference than the position of the pay line. It was applied on the floor, or the invert of the tunnel and on the sides and in the roof. The area above the spring line where the steel supports and liner plates were installed limited the volume of concrete placed to the liner plate position but below the liner plates, on the sides and on the invert of the tunnel, the plaintiff filled the entire space between the tunnel forms and the existing rock surface with concrete. Payment was made only to certain specified pay lines. The concrete placed beyond the specified pay lines has not been paid for by the Government.

The quantity of the excess concrete was computed as to volume by the plaintiff's engineers computing the volume of the tunnel bore within the central 610-foot section as it existed at the time of concrete lining. The plaintiff submitted in the record as Exhibit 81 a document entitled "Summary Tunnel Volumes". The computations show the difference between the cubic yards of tunnel concrete paid for by defendant and the amount actually placed, the difference being 644.61 cubic yards as a result of the changed conditions.

34. Plaintiff's extra costs of placing the additional concrete were as follows:

	Cu. yds.
Computed volume of concrete placed in tunnel	3,020.31
Less volume of tunnel concrete paid to plaintiff by United States Engineer office on Estimate #36—final	2,375.70
Additional concrete placed in tunnel	644.61

[fol. 751]

644.61 cu. yds. at the contract price of $25.00 per cu. yd.= $16,115.25—total claim including profit on Item 5.

35. The plaintiff's original schedule of operations did not provide for winter concreting. The fact that permanent tunnel protection in the form of steel ribs and liner plates was not authorized earlier delayed the completion

of the installation of the steel ribs and liner plates. It was apparent to plaintiff that the concrete would have to be poured in cold weather and plaintiff made provisions for that work. The plaintiff was required to, and did build a house to enclose its pumpcrete machine, install a boiler for preheating the water going into the concrete, enclose the batching plant and the cement plant and install steam boilers and pipes to protect and heat the materials in the bins and the stockpiles before they were incorporated in the concrete. This preparatory work was done between mid-October and December 15, 1947. Plaintiff's work in carrying out the heating of the concrete before placement and subsequent to placement due to the fact that plaintiff had to place concrete in subfreezing weather continued through the week ending April 24, 1948. Plaintiff commenced the concreting of the Almond Tunnel on December 15, 1947, and completed it on May 8, 1948.

36. Plaintiff's extra costs to prepare for and handle heat for winter concreting were as follows:

Direct labor and supervisory labor, taxes, insurance and overhead	$26,008.45
Cost of materials and other expenses plus overhead	6,693.08
Use of owned equipment: At 1947 AED rental rates, less 15% profit factor	4,487.76
Total claim Item 6	$37,189.29

37. As a result of concreting the tunnel, including the inside of the tunnel and the inlet area, during winter months the plaintiff suffered a loss of effciency and as a consequence incurred extra costs. The loss of efficiency was attributable to men and machines not producing as much in winter or subfreezing weather as would be produced during favorable weather, to equipment freezing and being difficult to start, to the fact that the equipment had to be shut down earlier in cold weather in order to clean and protect it for cold nights, and to the fact that carpenters erecting [fol. 752] forms had to work with gloves thus impeding their activity. On the basis of an eight hour day the plaintiff would get only five hours of work out of the equipment and employees engaged in the winter concreting operation.

Plaintiff estimated that there was a loss in efficiency of 25 percent in its labor force and its equipment and everything else which went into the cost of handling concrete in the winter time. This estimate was based upon the experience of plaintiff's engineers in carrying on concrete placement operations during the particular winter season. This estimate of loss of efficiency was corroborated by Mr. Miles Clair, a consulting engineer with extensive experience with respect to concreting, who was former chairman of the American Concrete Institute Committee on Winter Concreting.

Winter weather concrete operation at a location such as Almond Dam, as compared with concreting in favorable weather, reduces efficiency 25 percent below normal efficiency.

38. The plaintiff computed its cost due to the loss of efficiency in winter concreting by applying a 25 percent loss of efficiency to plaintiff's cost of concrete which was 85 percent of plaintiff's bid price of $25.00 a cubic yard or $21.25, thus arriving at a figure of $5.3125 (25 percent of $21.25) a cubic yard as a factor, and then applied this figure to the number of cubic yards that were poured during the period December 15, 1947 to April 13, 1948.

The extra costs plaintiff incurred by reason of loss of efficiency in winter concreting were as follows:

	Cu. yds.
Total concrete placed during period December 12, 1947 through April 13, 1948	2,984.6
Less concrete placed in Erie Railroad culvert during period	15.0
Concrete placed during period in connection with tunnel	2,969.6

2,969.6 cu. yd. at $5.3125 per cu. yd.=$15,776.00, total claim Item 7.

39. The plaintiff paid for the services of the consulting engineers who examined the tunnel to determine the need for permanent tunnel protection. The amount paid was $2,820.47. The consulting engineers employed by the plaintiff to advise on tunnel supports as being required [fol. 753] were Messrs. J. Murray Ridell, James G. Tripp, and Miles N. Clair, all engineering consultants.

The plaintiff's costs were based upon the invoices submitted by the engineering consultants. The charges were reasonable. Adding 15 percent profit to this amount results in a figure of $3,243.54.

40. Items of claims Nos. 2 through 7 inclusive, and item 16, totaling $149,617.36, are reasonably related to the costs of installing the tunnel supports and also the delay incident thereto as well as the disruption to the balance of the contract work. Other items claimed by the plaintiff bore no reasonable relation to the matter of failure to order installation of tunnel supports earlier.

CONCLUSION OF LAW

Upon the foregoing findings of fact, which are made a part of the judgment herein, the court concludes as a matter of law that plaintiff is entitled to recover, and it is therefore adjudged and ordered that plaintiff recover of and from the United States the sum of one hundred forty-nine thousand six hundred seventeen dollars and thirty-six cents ($149,617.36).

[fol. 754]

* * * *

On June 8, 1962, defendant filed a motion for reconsideration.

On July 18, 1962, the court entered the following order on said motion:

ORDER OVERRULING MOTIONS FOR REHEARING, ETC.—
July 18, 1962

These cases come before the court on motions for rehearing, amendment of judgment, new trials and relief from judgment or order under Rules 53 and 54 of the rules of this court and, on consideration thereof,

IT IS ORDERED that said motions be and the same are overruled and denied as follows:

* * * *

466-54 Carlo Bianchi and Company, Inc.
Defendant's motion.

* * * *

BY THE COURT

/s/ Marvin Jones
MARVIN JONES
Chief Judge

[fol. 755]

[Clerk's Certificate Omitted in Printing]

[fol. 756]

SUPREME COURT OF THE UNITED STATES

* * * *

ORDER ALLOWING CERTIORARI—Filed December 17, 1962

The petition herein for a writ of certiorari to the United States Court of Claims is granted, and the case is placed on the summary calendar.

And it is further ordered that the duly certified copy of the transcript of the proceedings below which accompanied the petition shall be treated as though filed in response to such writ.

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